



NASA WORKFORCE PLANNING DESK GUIDE

Version 2



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TABLE OF CONTENTS

1. Introduction	1
1.1 Purpose and Goals	1
1.2 Intended Audience	1
1.3 Document Overview	1
2. Overview of Workforce Planning.....	3
2.1 Past, Present, and Future of Workforce Planning	3
2.2 Workforce Planning Definition.....	4
2.3 Components of Workforce Planning.....	4
2.4 Levels of Complexity	6
3. Workforce Planning at NASA.....	7
3.1 Drivers for Workforce Planning at NASA	7
3.2 NASA Workforce Planning Definition	7
3.3 NASA Workforce Planning Principles.....	8
3.4 NASA Workforce Planning Framework.....	9
3.5 NASA Workforce Planning Measures	11
3.6 Roles and Responsibilities	11
3.7 Outcomes and Benefits.....	13
4. Strategic Workforce Planning	14
4.1 Definition.....	14
4.2 Drivers	14
4.3 Objectives and Outcomes	15
4.4 Participants	15
4.5 Current Process	16
4.6 Analyses	17
4.7 Reports and Outputs	18
4.8 Related Policies.....	20
5. Programmatic Workforce Planning	24
5.1 Definition.....	24
5.2 Drivers	25
5.3 Objectives and Outcomes	26
5.4 Participants	26
5.5 Agency-wide Process	26
5.6 Reports and Outputs	31
5.7 Related Policies.....	31
6. Operational Workforce Planning.....	33
6.1 Definition.....	33
6.2 Drivers	34
6.3 Objectives and Outcomes	34
6.4 Process Participants	35



6.5	Description of Process	36
6.6	Analysis	43
6.7	Reports and Outputs	48
6.8	Policies	49
7.	Workforce Planning Systems, Data, and Reporting	50
7.1	Introduction	50
7.2	Human Capital Information Environment	50
7.3	Workforce Information Cubes for NASA (WICN)	51
7.4	Workforce Integrated Management System	52
7.5	Competency Management System (CMS).....	58
7.6	Agency Labor Distribution System	60
7.7	N2	60
7.8	MdM.....	61
7.9	Federal Personnel and Payroll System Datamart (Support & Feeder System)..	62
7.10	NASA Organizational Profile System.....	63
7.11	Special Data Collection and Analysis Tools.....	63
8.	Summary	64
	Appendix A – OPM Workforce Planning Model	66
	Appendix B – Related Planning Activities	67
	Appendix C – Annual PPBE Phases and Steps.....	69
	Appendix D – Workforce Planning Governance	71
	Appendix E – Detailed Roles and Responsibilities	73
	Appendix F – FTE Tracking and Phasing: a Spreadsheet Example.....	79
	Appendix G – FAIR Act Inventory at NASA.....	83
	Appendix H – Data Elements Contained in WICN	87
	Appendix I – Acronym List	89

List of Figures

Figure 1: NASA Workforce Planning Framework	9
Figure 2: Agency-Wide Workforce Planning Process.....	10
Figure 3: Measures of Workforce Capability	11
Figure 4: Workforce Planning Roles and Responsibilities	11
Figure 5: Influence of Strategic Workforce Planning on PPBE.....	16
Figure 6: Planning Horizon for Strategic, Programmatic, and Operational Workforce Planning.....	25
Figure 7: Workforce Snapshots and Labor Pricing as Part of PPBE	27
Figure 8: Operational Workforce Planning and Budget Execution	41
Figure 9: Tools and Strategies Supporting Changes to Position and Competency Requirements.....	47
Figure 10: Key Outputs to Center Human Capital Functions	48
Figure 11: Systems and Data Resources Supporting Workforce Planning in PPBE Process	50



Figure 12: WICN Workforce Profile Standard Cube View	52
Figure 13: NASA Workforce Integrated Management System	53
Figure 14: Functions of Operational Systems that Provide Data to WIMS	53
Figure 15: WIMS Dashboard Reports	54
Figure 16: WIMS Ad Hoc Report.....	55
Figure 17: Key CMS Support Functions	60
Figure 18: FPPS and WIMS Systems Interface.....	63
Figure A-1: OPM Workforce Planning Model	
Figure C-1: Annual PPBE Phases and Steps	
Figure D-1: Components of Governance Structure	
Figure F-1: Example FTE Tracking and Phasing Spreadsheet	
Figure G-1: NASA FAIR Act Inventory Process	
Figure G-2: Commercial Activities Inventory, Executive Summary Data Table, June 2006	



1. Introduction

1.1 PURPOSE AND GOALS

Within the National Aeronautics and Space Administration (NASA), responsibility for workforce planning is distributed across multiple functions and levels. The NASA Workforce Planning Desk Guide brings together, in one document, descriptions of these distributed workforce planning activities. The main goals of the Desk Guide are to—

- ▶ Document standard workforce planning practices across the Agency
- ▶ Introduce NASA's workforce planning to practitioners and interested stakeholders
- ▶ Provide a general description, rather than a detailed “how-to”, of the Agency's workforce planning activities

The Desk Guide is updated continually to reflect new developments in workforce planning within and outside the Agency. It will act as a foundation reference document that captures the Agency's evolving workforce planning practices and capabilities.

1.2 INTENDED AUDIENCE

The Desk Guide is for workforce planning practitioners across the Agency who directly contribute to, or “own” parts of, the workforce planning process. The Guide serves this audience by presenting the basics of workforce planning and communicating current information about NASA's Workforce Planning Framework and associated activities.

Other users, such as human resource specialists, business analysts, and first-line supervisors, who are not directly involved in the workforce planning process may use the Guide as a reference document to help understand the Agency's approach to workforce planning.

1.3 DOCUMENT OVERVIEW

The desk guide is organized into seven parts addressing the workforce planning process in the context of the NASA organization, as follows:

- ▶ **Part 1: Introduction**—Defines the purpose, goals, and intended users of the Desk Guide.
- ▶ **Part 2: Overview of Workforce Planning**—Introduces the basics of workforce planning, including its brief history and common forms of analysis.
- ▶ **Part 3: Workforce Planning at NASA**—Sets the stage for understanding how NASA practices workforce planning. This section gives NASA-specific definition of workforce planning and an overview of NASA's Workforce Planning Framework.
- ▶ **Parts 4 through 6**—Profiles the Agency's strategic, programmatic, and operational workforce planning activities, describing for each type of activity its definition, objectives, outcomes, audiences, process, analysis, reports, and related policies.



- ▶ **Part 7: Workforce Planning Systems and Reports**—Outlines data, tools, and systems used across NASA to support workforce planning activities.

2. Overview of Workforce Planning

2.1 PAST, PRESENT, AND FUTURE OF WORKFORCE PLANNING

The practice of workforce planning stems from the need to manage workforce as an entity rather than just individuals within an organization. This need first arose several decades ago as practitioners tried, for example, to analyze how to utilize people to manufacture products efficiently or how to deploy large numbers of service personnel. These first “manpower planners” introduced the use of mathematical models for estimating organization-wide workforce supply and demand.

Today, both the private and public sectors practice workforce planning through a variety of approaches. For example, some companies plan for workforce on a regular basis, while others do so only when business conditions – e.g., market conditions, reorganizations, or restructuring – change enough to warrant the effort of planning.

Federal agencies have a formal workforce planning function to comply with federal standards and scorecards, such as the President’s Management Agenda. To guide federal workforce planning activities, the U.S. Office of Personnel Management (OPM) developed a workforce planning model.¹ This model provides a general framework to guide workforce planning activities in government organizations. Workforce planning is an important function in government organizations, particularly because of the inherently challenging civil service regulations, policies, and limitations on an agency’s ability to alter workforce composition quickly in response to mission change.

— Did you Know? —

NASA is today at a critical juncture in its history due to the confluence of such major events as the new space exploration projects, the transition from an operational to a development focus (e.g. Managing Shuttle Program operations vs. Leading Constellation Program development), and the increased attention to the growing retirement-eligible workforce. These circumstances, in combination, create extraordinary challenges for the Agency. Thus, NASA is trying to accomplish the goals of new exploration projects, which is as difficult as any since the Apollo era, at a time when budgetary and workforce issues require fresh and innovative approaches to effectively plan for resources.

Several trends in workforce planning will impact future practices:

- ▶ Increased focus on **“strategic” workforce planning** as the workforce counterpart of business planning, with longer planning time frames, and participation by senior leaders in addition to functional professionals
- ▶ Increased focus on **the connection between program planning, financial budgeting and workforce planning**, particularly for programs in formulation rather than operational phases of their lifecycle.
- ▶ **Enterprise risk management** that evaluates workforce misalignments for their risks to organizational success

¹ Appendix A presents the OPM Workforce Planning Model.

2.2 WORKFORCE PLANNING DEFINITION

In its simplest form, workforce planning is a set of analyses and business processes designed to evaluate the following questions:

- ▶ Does the organization have the right number of personnel and the right type of workforce to perform the organization's work now?
- ▶ Does the organization have the right number of personnel and the right type of workforce to perform the organization's work in the future?
- ▶ If not, what is the extent of the problem and what should we do about it?

A common definition of workforce planning is—

Workforce planning ensures that “the right people with the right skills are in the right place at the right time.” It includes a methodical process that helps an organization identify workforce gaps [or surpluses] and develop human capital strategies to meet organizational goals.

— Reference: Office of Personnel Management [OPM]; Department of the Interior [DOI]

— Did you Know? —

Many workforce planning definitions are available that provide variations on the themes outlined in this definition. However, they all have in common the basic notion that workforce planning compares the requirements of an organization's work to the workforce available to perform it, and seeks to resolve differences between the two.

2.3 COMPONENTS OF WORKFORCE PLANNING

Three key components of analysis serve as the fundamental building blocks of workforce planning – workforce demand, workforce supply, and the difference between them.

2.3.1 Workforce Demand

Workforce demand refers to the workforce required to perform work. It is a measurement of how many staff of a given type is needed to perform the work of an organization, now and in the future.

To determine workforce demand, one must first understand the nature of current and future work, paying particular attention on the size, complexity, and unique requirements of the work. It is also important to account for predictability, volatility, degree of strategic importance, visibility, and risk of the work. Once the work is defined, one can identify workforce demand or changes into specific workforce requirements relative to the organization's work structure.

Data supporting an assessment of workforce demand typically include the following:

- ▶ Multiyear projections of program civil service full-time equivalents (FTE) and competency requirements
- ▶ Longer term projections (often greater than 3 years) of workforce requirements
- ▶ Cost and projections for available funding

- ▶ Alignment with other federal initiatives.

2.3.2 Workforce Supply

Workforce supply refers to the workforce available to perform work. Supply analyses are a measurement of how many staff of what type an organization estimates to have now and in the future to perform work. Future availability is projected based on the number of employees who might leave and join the organization through attrition, hiring, promotion, lateral movement, and so on.

Data supporting an assessment of the workforce supply typically include the following:

- ▶ Workforce demographic statistics and trends
- ▶ Attrition rates
- ▶ Skill-based assessments (including minimum levels of civil service–based competencies that will ensure continued workforce capacity for effective performance and management of programs and functional areas)
- ▶ Workforce ceilings (limits) and other constraints

Efforts to understand workforce supply characteristics involve assessment of the number, types, scalability, deployment flexibility, and adaptability of the current workforce. The relevant analyses may also include supply modeling, sustainability, and future composition given workforce dynamics (e.g., attrition, turnover, retirement eligibility, and headcount/hiring constraints).

2.3.3 Gaps and Surpluses

Gaps and Surpluses are simply mathematically calculated differences between workforce demand and workforce supply:

- ▶ **Gaps** indicate a shortage of staff to perform the work. Gaps signal an organization’s existing or possible “backlogs” (work waiting to be performed).
- ▶ **Surpluses** indicate an excess of staff for the amount of work available. Surpluses may signal an under-productive workforce and resulting additional cost and lower employee morale.

To calculate the differences, the descriptions of workforce demand and supply must match for “type” and “number”:

- ▶ **Type**—Individual positions within the organization, groups of positions (e.g., systems engineers), or competencies (e.g.,

— Example —

An example of a simple demand/supply analysis:

“Organization X has 20 mechanical technicians, is expecting to lose 3 to retirement this year, and estimates it will need 15 mechanical technicians next year. Therefore, by the end of the year, the organization will have a surplus of 2 FTEs.”

An example of a more complex demand/supply analysis:

“Organization Y has 15 senior mechanical engineers, but only 12 of them are sufficiently proficient in structural system testing. Technical requirements of the work suggest that all 15 will be needed for that type of work; therefore, the organization has a proficiency gap of 3 in that skill area.”



knowledge, skills, and abilities that make up positions or functions)

- ▶ **Number**—Number of staff (“whole people”) equating to the number of FTEs.

Solutions to resolve gaps and surpluses can be identified and prioritized through various methods or “filters”; for example:

- ▶ Which gaps and surpluses have the most negative impact on the organization?
- ▶ Which gaps and surpluses are easiest for the organization to solve?
- ▶ Which future gaps and surpluses are most likely to occur?

2.4 LEVELS OF COMPLEXITY

The workforce planning definition and components described above represent the most basic workforce planning approach available to organizations. While this traditional supply/demand gap analysis is useful for certain aspects of planning (e.g., short term planning one year in the future), it alone does not account for many important aspects of workforce planning that are pertinent to the ongoing viability of the organization, such as the following:

- ▶ Shaping workforce consistent with strategic plans for the enterprise
- ▶ Improving agility of workforce supply by planning against more than one potential future work profile
- ▶ Defining total workforce capabilities and managing use of government (internal civil service) versus non-government (e.g., contractors and industry and academic partners) workforce to ensure sustainability.

More sophisticated types of analysis and planning are available to account for these aspects. Such analyses are based on other dimensions of demand and supply, tailored to the needs of the organization, and increase the value of the workforce planning process.

NASA has relied heavily on a traditional supply/demand gap analysis, but also recognizes the importance of additional levels of analysis. This has resulted in the development of a tiered workforce planning framework for the Agency at the strategic, programmatic, and operational levels.

3. Workforce Planning at NASA

3.1 DRIVERS FOR WORKFORCE PLANNING AT NASA

Over the last several years, NASA has increased its focus on workforce planning across the Agency, as evidenced by adoption of new planning processes and tools, revised policies, and greater participation in decision-making by Agency representatives. The main drivers behind this increased focus include the following:

- ▶ *Movement to Space Exploration* has defined major new missions for the Agency and marked the beginning of a multi-decade era of human spaceflight development. As a result, the Agency recognized the need to assess and manage risks associated with workforce transitions, particularly in light of the lead time required to shape workforce composition in government organizations.
- ▶ *Ongoing volatility in funding and mission profiles* within and among major mission areas at the Agency (i.e., Science, Aeronautics, and Exploration mission areas) continue to alter workforce requirements.
- ▶ *Implementation of “full cost management”* that is based on measures of workforce utilization requires the Agency to match its civil service workforce to mission requirements because programs, rather than a separate fund source, “pay” for civil service labor.
- ▶ *Government-wide emphasis* on (1) improving government efficiency and effectiveness, (2) controlling growth of the government workforce, and (3) measuring operational effectiveness in all areas, including workforce (e.g., President’s Management Agenda), NASA works to prevent growth in the overall size of the Agency’s civil service workforce and to leverage an external workforce to perform missions.
- ▶ *General concern about “aging” of the government workforce* commands that the Agency addresses its risk of losing large numbers of proven talent due to retirement eligibility.
- ▶ *Geographic distribution and decentralization* of existing workforce planning activities within the Agency

NASA is currently engaged in a multiyear effort to strengthen its workforce planning in response to these drivers. NASA began by establishing an Agency-specific definition and key principles of workforce planning, and from these elements developed a framework to direct the range of workforce planning activities.

3.2 NASA WORKFORCE PLANNING DEFINITION

In contrast to the definition of workforce planning provided in Section 2.2, NASA has adopted a functional definition of workforce planning that is tailored to the specific needs of the Agency and adds to concepts included in more traditional definitions. **NASA’s functional definition** is—

*The function of workforce planning at NASA is to assess the demand for and supply of workforce based on current and projected requirements, for the purpose of ensuring mission success. The objective is to achieve a reasonable **balance** between supply and demand to satisfy mission requirements within the available resource levels set for NASA while sustaining the **strategically important capabilities** of the workforce.*

This definition reinforces NASA's continuous effort to—

- ▶ *Balance workforce supply and demand*; that is, to work out alterations to both demand and supply, rather than just change supply to meet a fixed demand. For example, if a Center forecasts a workforce surplus, a set of solutions may include additional work packages (tasks), in-house work, or changes in schedules (i.e., work performance could occur earlier or later, or be shortened or stretched out).
- ▶ *Sustain capabilities*; that is, to consider both short and long term workforce needs as well as to plan and manage carefully for capabilities that are most important to have in-house.

3.3 NASA WORKFORCE PLANNING PRINCIPLES

The NASA workforce planning definition brings forth the **key workforce planning principles** of the Agency-wide practices—

- ▶ Effective workforce planning at NASA requires *active participation by Agency, Program, and Center representatives* according to their organizational locations and roles.
- ▶ Workforce planning is a function that is distinct from human capital planning and strategic and mission planning. It is, however, significantly linked to these functions and must coordinate with them *as part of the Agency's overall planning capability*. For example, strategic and mission planning provide important insights to such dimensions of workforce planning as *capability-based gap analyses*, and Center roles that affect the *assignment of work that is needed to balance the demand side* of the gap equation.
- ▶ Workforce planning must be closely integrated with budget planning to understand how to best use a defined set of workforce resources.
- ▶ Workforce planning can *cover multiple time frames—short (0–1 years), medium (1–6 years), and long (2+ years)*—to provide thorough assessments and to generate comprehensive sets of options for decision-making. For example, budget planning and workforce planning are performed at least annually (with a rolling 5-year horizon).
- ▶ Workforce planning *considers more than one set of future work requirements* because the future plan is not always well defined, and much of the work in the human spaceflight area in the next few decades will be new to the Agency.
- ▶ Workforce planning considers *the total workforce—internal civil servants and external contractors*, and the relationship between them—although the planning methods and objectives for each population differ. NASA plans its civil service workforce in the context of its existing and potential contractor workforce.

These principles guide the Agency’s approach to workforce planning and, together with NASA’s definition of workforce planning, form the NASA Workforce Planning Framework presented in the next section.

3.4 NASA WORKFORCE PLANNING FRAMEWORK

The Agency has developed a framework that translates the definition and key principles into specific levels of workforce planning and their objectives, participants, activities, and time frames outlined in Figure 1.

Figure 1: NASA Workforce Planning Framework

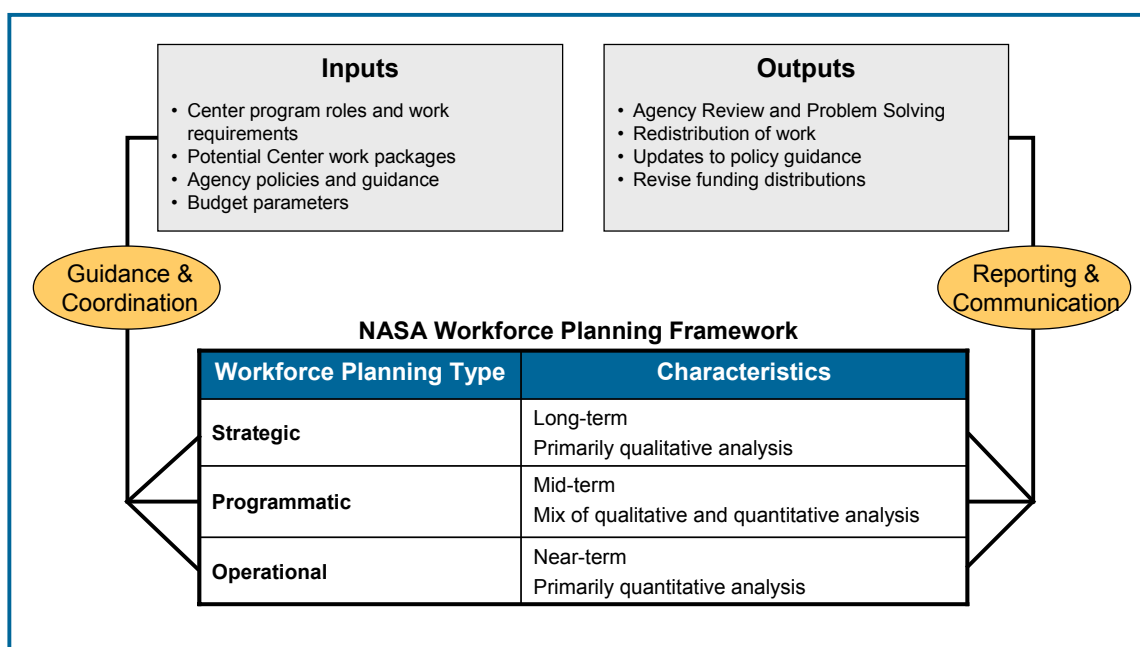
Time Frame	Key Decision-Makers	Purpose	Description
Strategic Workforce Planning			
Long-term (2+ years)	Agency, Program, and Center Senior Leadership	Plan each Center’s longer-term workforce composition and health	<p>Process: Annual data calls, special studies as needed</p> <p>Output: Periodically updated <i>Strategic Workforce Plan</i> that sets:</p> <ul style="list-style-type: none"> ▶ Changes to Center work roles ▶ Sourcing strategies ▶ Human capital tools (e.g., ceilings, hiring controls, flexibilities/legislation, buyouts) ▶ Workforce investments (e.g., training investments)
Programmatic Workforce Planning			
Mid-term (2–6 years)	<ul style="list-style-type: none"> ▶ Program Management ▶ Agency Leaders ▶ Center Leaders and Managers 	Align workforce with budget to implement workforce strategies	<p>Process: Annual planning, performance, budget, and execution process (PPBE) leading to Agency and Center decisions</p> <p>Output: Workforce data for budget; set of management actions to be implemented at Agency and Center levels:</p> <ul style="list-style-type: none"> ▶ Re-allocation of work packages ▶ Changes to individual program or project assignments or sourcing decisions ▶ Agency alterations to ceilings or hiring controls for next few years ▶ Center hiring and redeployment decisions, or redistribution of ceiling authorities across Directorates
Operational Workforce Planning			
Near-term (0–1 years)	<ul style="list-style-type: none"> ▶ Center Line Management ▶ Project Managers ▶ Human Capital Representatives 	Develop detailed plans to implement changes identified in the programmatic planning, and	<p>Process: Set of regular activities, performed weekly or monthly, for Center decision-making and management</p> <p>Output: Center workforce plans for the next year, with elements such as:</p> <ul style="list-style-type: none"> ▶ Directorate ceilings ▶ Hiring plans

Time Frame	Key Decision-Makers	Purpose	Description
		manage workforce	► Phasing plans

Many elements of NASA’s Workforce Planning Framework are in the process of being fully implemented, particularly at the strategic planning level, and represent areas of focus in workforce planning for the Agency over the next several years.

Figure 2 depicts the Agency’s cyclical workforce planning process, with ongoing data, reports, and feedback exchanges and coordination between various functions and phases.

Figure 2: Agency-Wide Workforce Planning Process



Inputs and outputs of the workforce planning process link a variety of other Agency strategic, business and resource planning processes. For example, program work requirements are essential inputs to workforce planning because they define the requirements that Centers use to plan their workforce. Conclusions or outputs of workforce planning result in a series of management actions that affect work planning, budgetary planning, and human capital planning.² Thus, coordination of planning activities is critical to making effective data-driven decisions across the Agency.

Some workforce planning activities are planned while others are ad hoc; however, the annual PPBE process is critical and tied to many workforce planning activities because it is the recognized Agency planning process that involves all key stakeholders within the Agency. This

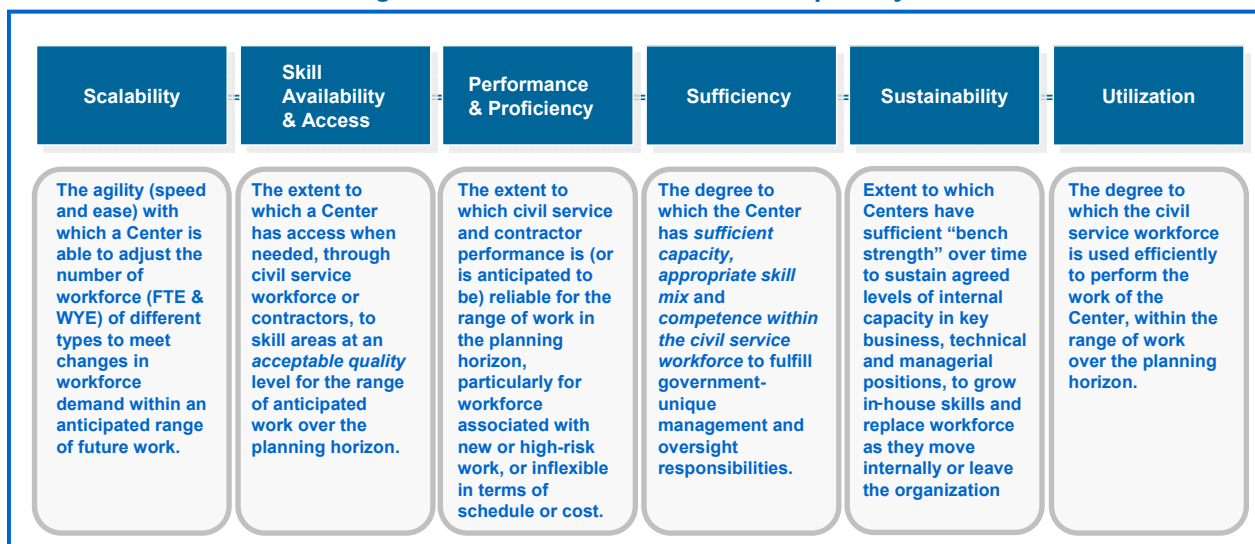
² Appendix B lists and defines activities related to workforce planning.

desk guide illustrates how the PPBE is used for the different types of planning in the Agency.³

3.5 NASA WORKFORCE PLANNING MEASURES

In an effort to address the additional planning complexities at NASA, six measures of workforce capability were developed to aid in the assessment of the Agency’s overall workforce health. These measures represent multiple criteria for evaluating the workforce and add dimension to the traditional definition of workforce health, such as the right number and type of workforce for a particular set of work. These measures have been incorporated into the workforce planning process to promote balanced decision-making. Figure 3 presents the six measures:

Figure 3: Measures of Workforce Capability



These six measures are used in strategic, programmatic, and operational levels of workforce planning, at the Agency and Centers. They serve as a conceptual framework for evaluating workforce capability. In different years, the emphasis for evaluation may vary. This concept accounts for the range of potential focus areas to be examined. For example, Agency decisions about in-house project assignments take into account how much work is needed for “Sufficiency” at each Center. Programmatic budget planning considers “Skill Availability and Access” in distributing work assignments across Centers. Centers examine “Sustainability” in their operational planning to ensure workforce bench strength in their organizations over time.

3.6 ROLES AND RESPONSIBILITIES

The Agency, Mission Directorates (MD)/Programs, and Centers have a shared responsibility for workforce planning, and each plays an important role, as described in Figure 4:

Figure 4: Workforce Planning Roles and Responsibilities

Organization	Workforce Planning Role/Responsibility
Agency	▶ Oversee the Agency-wide workforce actions and planning process

³ Appendix C provides a summary of the annual PPBE phases and steps.



Organization	Workforce Planning Role/Responsibility
	<ul style="list-style-type: none">▶ Develop or revise Agency workforce policies and guidance▶ Make decisions related to Center work roles and internal versus external labor sourcing, balancing Program and Center considerations▶ Assess risks to Agency associated with workforce misalignments and apply resources to address them▶ Communicate workforce issues to external stakeholders▶ Conceive, analyze, promote, and implement new workforce flexibilities
Mission Directorates/ Programs	<ul style="list-style-type: none">▶ Plan work and funding distribution▶ Define work requirements▶ Negotiate workforce resources to perform work▶ Solve issues around distribution of work and funding with Agency and Centers▶ Assess and communicate risks to program performance associated with workforce
Centers	<ul style="list-style-type: none">▶ Identify potential work▶ Monitor condition of workforce capabilities▶ Define workforce requirements to perform assigned work▶ Identify existing or potential workforce misalignments and health issues, and communicate them to Programs/Agency▶ Provide feedback on policies and practices

At the Agency level, NASA enables Centers to conduct a full range of workforce planning analyses by: (1) establishing and monitoring Agency-wide workforce planning processes and (2) supporting problem-solving and decision-making between Programs and Centers. Each of NASA's four MDs and their associated Programs provides work to Centers, while each Center receives work requirements from multiple Programs. Because the relationship among Centers and MDs are matrixed this way, the Agency must provide a mechanism for problem-solving and mitigation of misalignments in areas such as work allocation and work funding.

The Agency also coordinates distribution of work and funding to better consider what roles/work will be outsourced, remain in-house, assigned, and competed. These decisions lie mainly with several senior management groups within NASA: the Strategic Management Council (SMC), Program Management Council (PMC), Operations Management Council (OMC), and Agency-Wide Workforce Planning Governance Structure.⁴

In addition to Agency, MD/Program, and Centers, other entities involved in the workforce planning process include the Office of Human Capital Management (OHCM), Program Analysis and Evaluation (PA&E), Office of Program and Institutional Integration (OPII), and the Office of the Chief Financial Officer (OCFO).⁵

⁴ Appendix D describes the Workforce Planning Governance.

⁵ Appendix E lists the organizations involved in workforce planning and describes their roles and responsibilities.



3.7 OUTCOMES AND BENEFITS

NASA Agency-level workforce planning process is expected to show what changes to the workforce are necessary to meet mission goals. The process yields reports, data, and context (i.e., rationale and explanation) that describe the condition of the workforce, identify key risks, and drive human capital programs or adjustments to work distribution.

NASA uses the information in workforce planning reports to—

- ▶ Summarize business assumptions (e.g., work and funding levels)
- ▶ Outline management actions directed to mitigate or avoid the risk of near-term and long-term misalignments and to ensure an adequate supply of the necessary capabilities
- ▶ Describe current or anticipated misalignments that cannot be solved within the Center, and solutions that require Agency approval, assistance, or attention (e.g., need more work, need more funding, need approval for reduction in force [RIF])
- ▶ Present Center reports to MDs/Programs that identify specific capacity and capability to perform work or tasks not yet assigned, in the context of how remaining capacity would be deployed in that same time frame
- ▶ Provide Agency with reports of summary of areas of risk that impact distribution of funding and work for MDs/Programs across multiple Centers
- ▶ Influence levels and mix of contracted work and the general nature of the procurements needed to perform the work and maintain adequate Agency flexibility.

The following sections provide detailed descriptions of each level of workforce planning presented in the NASA Workforce Planning Framework, including Strategic Workforce Planning (Part 4), Programmatic Workforce Planning (Part 5), and Operational Workforce Planning (Part 6). Each part describes the specific objectives and desired outcomes of that level of planning, presents the current planning process, and gives examples of the types of analyses used and the reports and outputs generated throughout the process.

4. Strategic Workforce Planning

4.1 DEFINITION

The 2006 Conference Board⁶ report proposed that, for a workforce planning exercise to be “strategic,” it must “(1) be as much a business planning process as a workforce management process, (2) involve senior leaders in the organization, and (3) combine the broad direction of the organization with the precise numbers and granular details undertaken in operational workforce planning.” NASA’s definition echoes these main themes:

Strategic workforce planning is the discipline of determining the size and composition of a future workforce that is able to perform well the organization’s most important functions, maintain capabilities, and fulfill key business goals.

Within the discipline of strategic workforce planning (SWFP), NASA considers the following:

- ▶ **Optimal size and composition of the total workforce at each Center and the Agency overall**, with in-house versus external roles assigned to civil servants versus contractors consistent with Agency principles and government regulations
- ▶ **Balance of workforce and work over the long-term horizon**; that is, workforce scalability needed if work requirements change
- ▶ **Maintenance or growth of capabilities** (e.g., systems engineering or new vehicle development) most important to the Agency
- ▶ **Overall workforce health**, as determined by six workforce measures (i.e., scalability, skill availability and access, performance and proficiency, sufficiency, sustainability and utilization)
- ▶ **Other business goals** or constraints, such as an expansion of reimbursable business, or holding to a flat budget over the next decade.

4.2 DRIVERS

NASA conducts SWFP to improve its ability to meet many challenges the Agency is facing today. For example, significant changes to its mission set, expansion restrictions for size or budget, and workforce that cannot be reshaped quickly. The more specific drivers for SWFP also include the following:

- ▶ Focus on new exploration projects established completely new human spaceflight missions to the Moon and to Mars, and scheduled an end to the Space Shuttle program, the final flights scheduled in 2010. This change in mission requires that the Agency move from operations work to development work for the first time in three decades, including multiple development cycles and key transition years (such as 2010 to 2011).

⁶ Conference Board, *Strategic Workforce Planning—Forecasting Human Capital Needs to Execute Business Strategy*, August 2006.

- ▶ Focus on reestablishing and preserving in-house capability in certain areas (e.g., systems engineering)
- ▶ Effort to utilize each Center to its fullest capacity with mission sets at each location that can be sustained over time
- ▶ Pressure to reduce the overall size of the civil service workforce, and the proportion of mission support workforce in response to the decrease in Center Management and Operations (CM&O) funding

4.3 OBJECTIVES AND OUTCOMES

The objectives and desired outcomes of SWFP activities are to provide sound, integrated, and thoughtful analyses that support the Agency senior leaders (including Agency, Program, and Center leaders) in setting the long-term direction for the workforce and communicating effectively with external bodies (e.g., Congress, U.S. Government Accountability Office [GAO], Office of Management and Budget [OMB], private and academic communities).

Subjects covered in these outputs may include:

- ▶ Centers' programmatic roles (new roles or changes to existing roles)
- ▶ Types of work that should be performed in-house
- ▶ Roles that should be civil service only versus external only versus shared at the Agency and individual Centers
- ▶ Agency ceiling or hiring control guidance
- ▶ Permanent/temporary mix targets (i.e., the target ratio at the Center-level)
- ▶ Additional flexibilities and legislation
- ▶ Workforce investment programs (e.g., training initiatives or funds)
- ▶ Centers' strategies for altering workforce size, composition, performance, or management

The principal output is a strategic workforce plan—updated periodically—that reflects the Agency's position on workforce and establishes goals, parameters, and key issues to be resolved while conducting programmatic and budget planning activities. Other outputs include sponsorship of new initiatives (e.g., human capital legislation), issues for further studies (e.g., Space Shuttle transition), workforce guidance not dependent on the budget process (e.g., hiring controls), and reports or testimony for external bodies such as Congress or GAO.

4.4 PARTICIPANTS

The SWFP process involves participants from across NASA at the Agency, Program, and Center levels; however, the key SWFP decisions are made at the Agency level, with substantive input from the Centers. Primary participants in the SWFP processes include:

- ▶ Agency leaders or their designees (e.g., members of SMC and OMC)
- ▶ MD/Program management and representatives

- ▶ Center leadership, management, and representatives
- ▶ Acquisition strategy team members
- ▶ Program analysis and evaluation (PA&E) personnel
- ▶ Office of Program and Institutional Integration (OPII) and Office of Human Capital Management (OHCM)

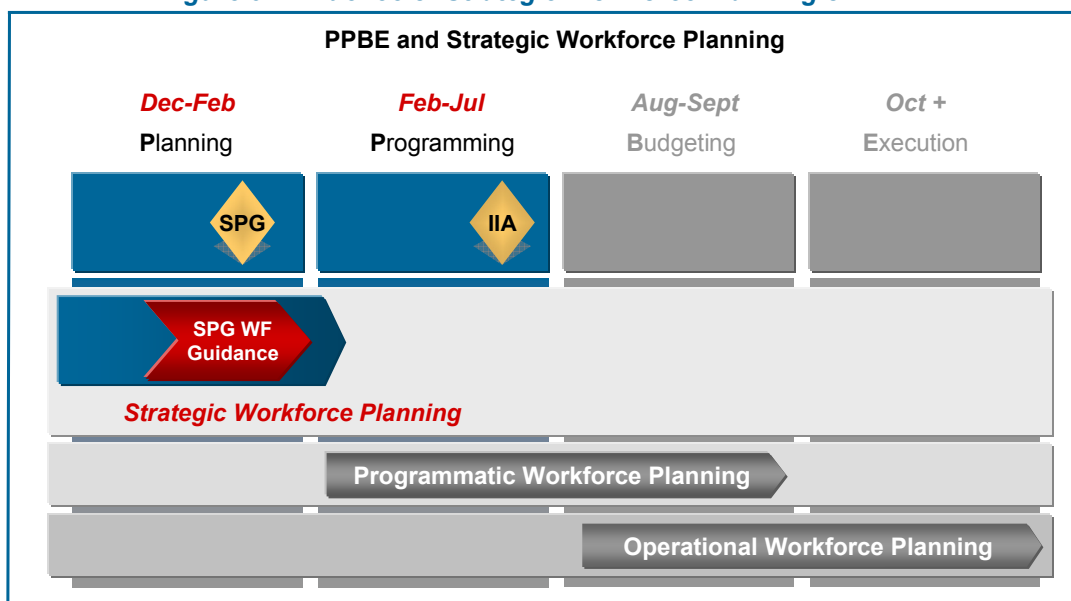
4.5 CURRENT PROCESS

Because SWFP activities at the Agency are relatively new, this type of planning is less well developed than programmatic and operational workforce planning. To date, SWFP activities have consisted of additions to the Business Planning phase (“2nd P”) of the annual PPBE budget cycle and ad hoc studies to address particular issues of concern.

Strategic Workforce Planning PPBE Process

The elements of SWFP embedded in the PPBE process are connected to Programmatic Workforce Planning. For example, the determination of sustainable workforce size, which is strategic in nature, is an output of programmatic planning with an additional view beyond the normal budget horizon. Figure 5 shows the connection between the PPBE steps and reports associated with workforce planning and the SWFP process.⁷

Figure 5: Influence of Strategic Workforce Planning on PPBE



The details of the process shown in Figure 5 include the following:

- ▶ *December–February*
 - Publish workforce section of the Strategic Planning Guidance (SPG) (see 2007 SPG reference box on page 23) that specifies workforce priorities, guidance, or targets that

⁷ Appendix C presents a summary of all PPBE steps.

apply to the beginning of the next budget cycle. This step combines information from workforce strategy with modifications needed to respond to the budget passback or recent changes in Agency thinking

- Identify key strategic workforce issues to be investigated as part of the PPBE process for the upcoming cycle
- ▶ *February–July*
 - Gather data on Agency issues of strategic importance to the Agency: Centers provide information within the Institutional Infrastructure Analysis (IIA) deliverable (e.g., in 2007, Centers applied Measures of Workforce Capability, designed to assess and improve health of workforce at each Center, and reported results in the IIA).
- ▶ *August–September*
 - Using SMC and OMC as decision-making bodies, present findings and recommendations on key strategic workforce issues (e.g., Center mission roles and long-term impact on workforce, issues related to workforce health, and requirements for new legislation)

Ad Hoc Studies

Ad hoc studies are needed in addition to the PPBE cycle to pursue specific strategic topics. For example:

- ▶ Strategic Workforce Management Model (SWMM)—Initiative designed to estimate Agency workforce size and types through 2020 in response to the planned set of missions. This initiative will consider alternatives related to how much work is performed in-house versus externally.
- ▶ Space Shuttle Transition—Initiative designed to estimate the degree of alignment between Space Shuttle workforce coming free in 2011 and requirements of Constellation Program work in 2012–2015, for both civil service and contractor workforce. This initiative may lead to specific workforce recommendations (e.g., flexibilities legislation, Center strategies) and will also establish a process for examining future workforce transitions (e.g., next cycle of development—establishing Lunar Outpost).

4.6 ANALYSES

SWFP relies on analyses tailored to the particular issues of that cycle or special initiative. For example, Space Shuttle mapping analyses were developed to address transition-specific objectives. Many analyses in support of SWFP are ongoing or recurring in every annual planning cycle, such as the following:

- ▶ Development of **workforce targets** (e.g., perm/term mix, Center ceilings, and hiring authorities) based on previous data, current state, and PPBE planning data
- ▶ Analysis of **sustainable workforce size** over the next decade (now based on 6-year budget data, but in future on SWMM output) to inform Agency size and Center ceilings

- ▶ Analysis of **Centers' speed of change** (i.e., how quickly civil service workforce could scale up or down overall based on losses, hires, and perm/term ratios)
- ▶ **Qualitative interpretations of budget gaps and surpluses**, designed to bring to the surface areas of greatest risk that require Agency attention.

Sample Analysis: Critical Competencies

Over the last few years, NASA has conducted analyses to identify the Agency's "critical competencies" to support existing and future flexibilities legislation. Analyses to date on this subject have combined quantitative gap analyses from the Competency Management System (CMS) with qualitative assessments by each Center. The focus areas of the analyses have included staffing, student programs, employee development, and realignment. The purpose of these analyses has been to identify areas of the workforce that must, more than other areas, have a healthy in-house population to meet strategic objectives (e.g., support Agency systems engineering capability in light of new Constellation systems). Mission-critical areas have been priorities for hiring and for addressing misalignments. NASA manages human capital programs (e.g., Voluntary Early Retirement Authority [VERA]/Voluntary Separation Incentive Authority [VSIP]) and the use of recruitment/retention authorities uniquely authorized for NASA based on these analyses.

Sample Analysis: Measures of Workforce Capability

A major recent initiative was the development of six measures of workforce capability that are used to analyze multiple dimensions of workforce health at the Centers and to identify areas of current and potential future misalignments (e.g., scalability, skill availability and access, performance and proficiency, sufficiency, and sustainability). The Centers have completed an assessment of their workforce using the full list of measures as part of the 2009 budget process, and provided a narrative summary of findings as part of the PPBE process. These findings focused on the range of work outlined in a budget-related workforce planning exercise. The measures have been institutionalized as annual activities, but the particular method of analyzing the workforce using these measures will be improved in the next planning cycle (e.g., quantitative metrics will be added to the analysis and reporting process).

4.7 REPORTS AND OUTPUTS

As mentioned in Part 4, SWFP activities yield a variety of outputs. While some outputs are follow-on activities or initiatives and various forms of workforce guidance, others are in the form of reports for internal and external audiences.

Critical Competencies

The critical competencies are a subset of those listed in the NASA CMS Workforce Competency Dictionary. To meet its human capital challenges, the Agency focuses its recruitment, retention, and development efforts on the competencies critical to its missions. For example, various recruitment initiatives and incentives target critical competency areas, and employees with critical competencies are excluded from buyouts.



The critical competencies are established at the Agency level and are updated periodically based on inputs from Centers, MDs, and Mission Support Organizations (MSO) regarding: (1) magnitude of the gap between competency requirements and the availability of the competency, (2) difficulty of closing the gap due to labor market conditions or the uniqueness of expertise required, and (3) urgency in closing the gap to fill an immediate important need.

External Reports and Briefings

In recent years, Congress, GAO, OMB, and OPM have increased their attention to NASA's workforce issues and planning capabilities. These oversight organizations focus on NASA's transition of the civil service workforce to new Exploration projects, but they also show interest in other subjects, such as science workforce and capabilities.

Standing reporting requirements for workforce planning to these external organizations include:

- ▶ Quarterly updates to OMB/OPM President's Management Agenda (PMA) Scorecard
- ▶ OPM's Human Capital Management Report, which covers the Human Capital Assessment and Accountability Framework (HCAAF) model
- ▶ OPM's Proud 2 Be

Ad hoc reporting examples include the following:

- ▶ Briefings to Congress, the Aerospace Safety Advisory Panel (ASAP), and the NASA Advisory Committee (NAC) on a variety of workforce planning issues (e.g., Shuttle transition)
- ▶ Budget-workforce updates to OMB and OPM
- ▶ Responses to questions submitted by oversight and advisory bodies

Most of these oversight organizations request from NASA a sizable amount of information that contains important insights and detail on historical and current-state workforce trends, particularly in the area of planning for Exploration Programs (e.g., Constellation). The Agency will be better equipped to fulfill these requests by performing more targeted data collection and analyses included in the strategic level of workforce planning.

Workforce Strategy Document

The Workforce Strategy report describes the current state of the workforce, recent related decisions, ongoing issues, and unresolved risks. It documents what happened during the previous planning cycle and establishes forward plans from an initiative, workforce planning process, and issue-resolution point of view. In April 2006, the NASA Workforce Strategy was documented, published, and presented to Congress. This document focused on business conditions at the Agency, competency trends, and the most pressing workforce challenges at that time. This report will be adjusted and expanded in the future.



4.8 RELATED POLICIES

Legislative Directives

Most policies related to workforce are published by the Agency for internal use. In some cases, legislation impacts workforce or human capital policies, creating external reporting requirements or placing new restrictions on what the Agency can do within its policies. For example—

- ▶ NASA Appropriation from 2008: “NASA Appropriation, found in S.3182, Commerce, Justice, Science, and Related Agencies Appropriations Act, 2009: “Notwithstanding any other provision of law, no funds shall be used to implement any Reduction in Force or other involuntary separations (except for cause) by the National Aeronautics and Space Administration prior to September 30, 2009.”

In recent years, OMB established “targets” for NASA’s civil service workforce size that decrease the current size over the following five years.

NASA Agency-Wide Policies

With respect to Agency policy, workforce planning is a relatively new formal area within human capital offices, and, therefore, the body of policy available within the Agency is smaller than it is for other human capital areas such as classification. Because workforce planning is distributed across multiple functions and offices at the Headquarters, including the OCFO, OPII, and OHCM, policies that affect workforce planning do not have a single source. Workforce planning relies on communication mechanisms such as Agency directives, SMC/OMC approval, or Office of the Chief Human Capital Officer (OCHCO) statements. Temporary subjects such as FTE ceilings will continue to be documented and communicated in guideline memoranda issued by senior Agency leadership.

The existing Agency policies that are directly relevant to SWFP include:⁸

- ▶ **NPD 1000.0, *Strategic Management & Governance Handbook (Expires 08/30/2010)***

This document describes the current NASA administrator’s governance model, including organization structure and decision-making authorities. The Handbook outlines the role of the SMC and OMC in decision-making for the Agency, and divides the programmatic (Mission Directorate) and institutional (Centers) organizations’ responsibilities. The document makes clear, although brief, references to the need for long-term workforce planning and informs the reader of how Agency-wide decisions, including those about workforce, are made.

- ▶ **NPD 3010.1, *Strategic Workforce Management (Expires 11/10/2008)***

— Reference —

The Agency policies below are configuration-controlled documents that can be accessed via the NASA Online Directives Information System (NODIS) <http://nodis3.gsfc.nasa.gov/>.

⁸ In general, NASA Policy Directives (NPD) and NASA Procedural Requirements (NPR) serve to establish instructions, authorities, and guidance.



This document establishes policies and responsibilities to ensure that the Agency engages in integrated workforce planning. When updated in 2008, the NPD will establish the roles that comprise the Workforce Planning Governance Structure as NASA policy.

- ▶ **NPD 3310.1B, *Distinguishing Between Contractor and Civil Service Functions* (Expires 09/22/2012)**

This 2001 document summarizes what federal laws and regulations require.

- ▶ **NPR 7120.5C, *NASA Program and Project Management Processes and Requirements* (Expires 03/22/2010)**

This document outlines roles, responsibilities, and required activities for NASA programs and projects, including resourcing (workforce and other) and make/buy decisions. This document is relevant for workforce planning because it formalizes the requirement for projects, rather than for institutions, to provide information for and make decisions about workforce demand and sourcing.

Acquisition Strategy Policy and Strategic Workforce Planning

The Agency strategic acquisition approach: 1) enables senior management to make informed business decisions earlier in the planning process; 2) identifies the managers responsible and accountable for strengthening links between program/project decision-making and financial management information, and; 3) supports disciplined cost estimating at the Agency level. The Agency's acquisition strategy allows Programs, administrators, and process owners to make outsourcing decisions and undertake effective cost-estimating and performance management processes. From a SWFP perspective, Agency acquisition processes serve to establish strategic priorities based on mission requirements, quantify workforce and operational risks, and better manage program costs.

Policy Accountability and Follow-Up

The Agency encounters, from time to time, issues of policy noncompliance. In each case, the Agency management takes steps to resolve it. Centers are accountable for managing their workforce according to the policies that are in place. For example, Centers are required to manage hiring, monitor and adequately forecast attrition in order to conform to annual Center FTE ceilings provided by the NASA Associate Administrator.

— Reference —

How Workforce was Addressed in 2010 Budget Strategic Planning Guidance

1.4.7 Workforce Priorities and Assumptions: The Agency is committed to improving the overall capability of the workforce and its alignment to NASA's near- and long-term mission requirements while maintaining ten healthy field Centers. As part of this commitment, the Agency must maintain a balance among civil service, contractor, and other external partners. With this balance, the Agency will be able to sustain or build in-house intellectual capital while providing independent technical and programmatic checks and balances.

NASA's stated workforce priorities for the programming and budgeting phases of the PPBE in the FY 2010 cycle were to:

- Maintain steady Center workforce levels throughout the budget horizon**, to include both civil servants and contractor WYE. Demand for civil servants that exceeds existing levels should shift to centers where workforce is available.



- b. **Programs and projects are to commit to 5 year workforce planning** and taking into account the available skills across the agency, aggressively plan work assignments to the centers.
- ▶ When firm commitments are known, both FTE and funding is to be identified.
 - ▶ Probable work assignments that have uncertainty associated with pending competitive selections and acquisition awards, but has funding associated with it, is to be planned in the “mission forecast” line. Centers should understand when work assignments are planning assumptions and not see them as guaranteed work.
 - ▶ Mission Directorates may have to direct work if competition decisions go differently than the mission forecast plans, available for new work (AFNW) is created and it is impractical for Centers to adjust workforce accordingly. The requirement to redirect will be determined on a case-by-case basis. In the execution year, Mission Directorates maintain responsibility for FTE funded in N2 if those projects are cancelled.
- c. Center Directors are responsible for **managing workforce to near and long term funding levels, and therefore should continue to evolve to a more scalable workforce** that can respond to changes in programmatic requirements. Greater scalability will be achieved through targeted and prudent use of term-limited civil service workforce and strategic use of contractors.
- ▶ Centers will evolve to toward achieving and maintaining a minimum profile of 15% term/temporary workforce for Science and Engineering positions by 2013 (not including students/coops).
 - ▶ There will be no agency reserve to allocate to workforce funding gaps; therefore the general policy is that Center Management and Operations accounts are to be used to address Available For New Work (AFNW).
 - ▶ It is expected that the workforce demand for FY 2009 will materialize as we near the execution year and at the completion of the workforce requirements planning process. However, if the demand is insufficient at a center to sustain the current workforce, the Center Directors will assess and articulate the impact to absorb this cost in CMO and surface this with the IIA submissions. The acceptability of these impacts will be assessed at the Budget Integration PMC in June and evaluated against alternative program funding sources.
- d. Centers are to **proactively address civil service workforce surpluses, shortfalls and skill mix issues early and throughout the planning process**. Use the full range of work distribution and existing human capital options to address or limit anticipated workforce gaps and surpluses over the 5-year budgeting horizon through completing three “workforce snapshots”.
- e. **Ensure the civil service workforce has the skills** to accommodate the next decade of design and development work as well as post-design development phases.
- ▶ Use rehiring opportunities to alter workforce mix within the size of workforce provided by Center targets
 - ▶ Center Directors are expected to **rigorously apply performance management tools and processes to eliminate** non-performers from their center civil service cadre workforce.
- f. Commit to preserving long term workforce health, including robust civil service workforce pipelines and **student programs**.
- g. **Plan a smooth transition of workforce from Shuttle to Constellation**, following the last Shuttle flight in 2010, including workforce supporting Shuttle transition and retirement (T&R) activities



Center-Level Workforce Policies and Guidance

Centers can develop policies and other forms of guidance specific to their Centers as needed. For example, Centers can establish sub-processes, systems, and procedures, or can impose hiring or FTE ceiling constraints for MDs, divisions, or branches as needed to meet their objectives and manage their institutions appropriately. These Center-specific policies cannot conflict with Agency direction or policy.

5. Programmatic Workforce Planning

5.1 DEFINITION

Both strategic and programmatic workforce planning include future planning for time frames well beyond the concrete near term and include similar subject matter (e.g., FTE ceiling or desired future size of a Center's workforce). What distinguishes Programmatic Workforce Planning (PWFP) from other levels of planning is that it is dependent on decisions generated from the PPBE process, whereas SWFP activities do not depend directly on the budget process and related planning. PWFP focuses on solving workforce alignment problems in the mid-term (one to six years beyond the current year) rather than on a longer-term horizon.

NASA's definition of PWFP emphasizes these themes, as follows:

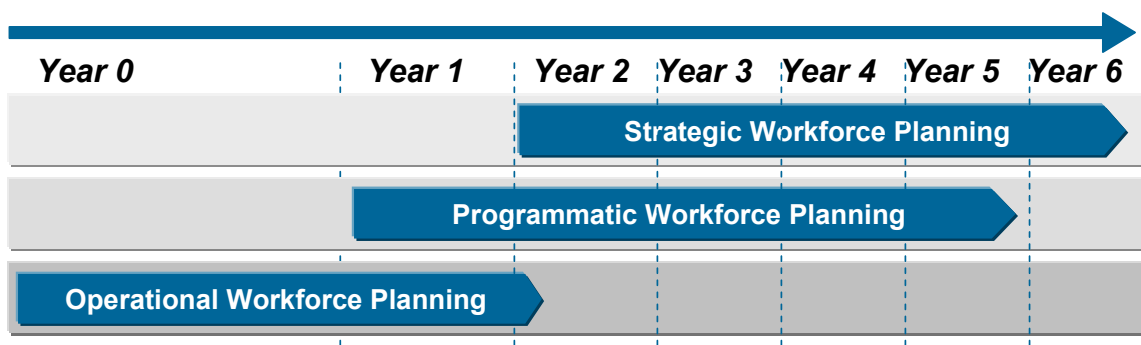
Programmatic workforce planning is the discipline of matching workforce to program and work requirements, using specific work assignments and resource distributions associated with a proposed Congressional budget, and objectives established through strategic workforce planning. Through this comparison, potential misalignments can be addressed through alterations in work, workforce, or resource levels.

Within PWFP, NASA considers the following:

- ▶ **Center work assignments and potential work packages** and the impact of different combinations on workforce demand at each Center
- ▶ **Impact of sourcing decisions on workforce requirements** and desired Center in-house versus external roles
- ▶ **Maturity of program planning, funding and work requirements**, and impact on workforce requirements within the planning system
- ▶ **Accuracy of workforce requirement estimates** - whether the estimated number and type of workforce needed to do the work is realistic given what is known about work requirements at the time of planning
- ▶ **Workforce capacity gaps and surpluses** at each Center, overall, and in different skill areas
- ▶ **Impact of budget workforce plans on other strategic goals** or constraints, such as maintaining organization or workforce capabilities, and achieving an optimum size at the Agency and at individual Centers

Just as there is overlap between SWFP and PWFP, there is also overlap between Programmatic and Operational Workforce Planning (OWFP) (see Figure 6). The budget process, on which PWFP is largely based, covers a broad time horizon (1–6 years) that includes the short-term planning horizon that is considered within OWFP.

Figure 6: Planning Horizon for Strategic, Programmatic, and Operational Workforce Planning



Despite this overlap, the emphasis of programmatic planning is different from that of operational planning. One way to differentiate the two is to consider planning activities “programmatic” if—

- ▶ They consider **workforce issues beyond two years** (e.g., pattern of workforce surpluses across the six-year horizon).
- ▶ They consider **longer-term impact to workforce of near-term decisions** (e.g., impact on Centers of assigning new work packages beyond Budget Year [BY] 2).
- ▶ They **support development of a six-year budget** that will be submitted and defended.
- ▶ They **drive institutional changes** that will last (e.g., alterations to composition or structure of workforce).

5.2 DRIVERS

Programmatic planning at NASA *expands* the fidelity of data beyond the first two years and the complexity of analyses and decision-making included in the budget planning process for a number of reasons, including the following:

- ▶ External scrutiny of NASA and the success of its missions make a “business-as-usual” approach to workforce estimating and budget submits no longer appropriate.
- ▶ The new Exploration projects require reshaping the workforce over a long period of time and therefore necessitate planning beyond two years.
- ▶ Several large transitions overlap in years during which one major program ends and another begins. These transitions require planning decisions be made at least three or four years in advance (e.g., plans for transition of Shuttle workforce in 2011 began in 2005).
- ▶ The Agency decides on work and workforce changes that must have longevity (e.g., assignments of work, sourcing decisions) because they can be difficult and inefficient to undo.
- ▶ NASA has multiple objectives that include staying within budget, schedule, and performance on existing missions while maintaining and improving the institution and infrastructure for future projects. This requires ‘multidimensional’ planning that

complements the traditional bottom-up budget development with a coordinated top-down approach.

- ▶ The Agency must have a comprehensive picture of contracted workforce and its intersection with civil service for problem solving and informed procurement decisions

5.3 OBJECTIVES AND OUTCOMES

PWFP activities aim to provide sound, integrated, and thoughtful workforce analyses to enable stakeholders across the Agency (including Agency, Program, and Center representatives) to—

- ▶ Implement workforce strategies (as defined through the SWFP process)
- ▶ Identify institutional and program misalignments
- ▶ Assess the risks of misalignments
- ▶ Make sound choices about how to reduce the risks and improve efficiency

The desired outcome of programmatic planning is the effective management of competing interests, and programmatic or institutional risks.

5.4 PARTICIPANTS

PWFP involves participants from across NASA at the Agency, Program, and Center levels. However, many key decisions are made at the Program or Center levels, with substantive input from other Agency organizations. Primary participants in the Programmatic Workforce Planning processes include the following:⁹

- ▶ MD/Program management and representatives
- ▶ Center leadership and workforce planning representatives
- ▶ PA&E
- ▶ OPII and OHCM
- ▶ Agency and Center OCFOs

5.5 AGENCY-WIDE PROCESS

At the Agency level, PWFP activities occur in the programming and budgeting phases of the PPBE process, and focus on assessment of alignment between Center workforce and the Program work of the Agency. Figure C-1 provides an illustration of this process.¹⁰

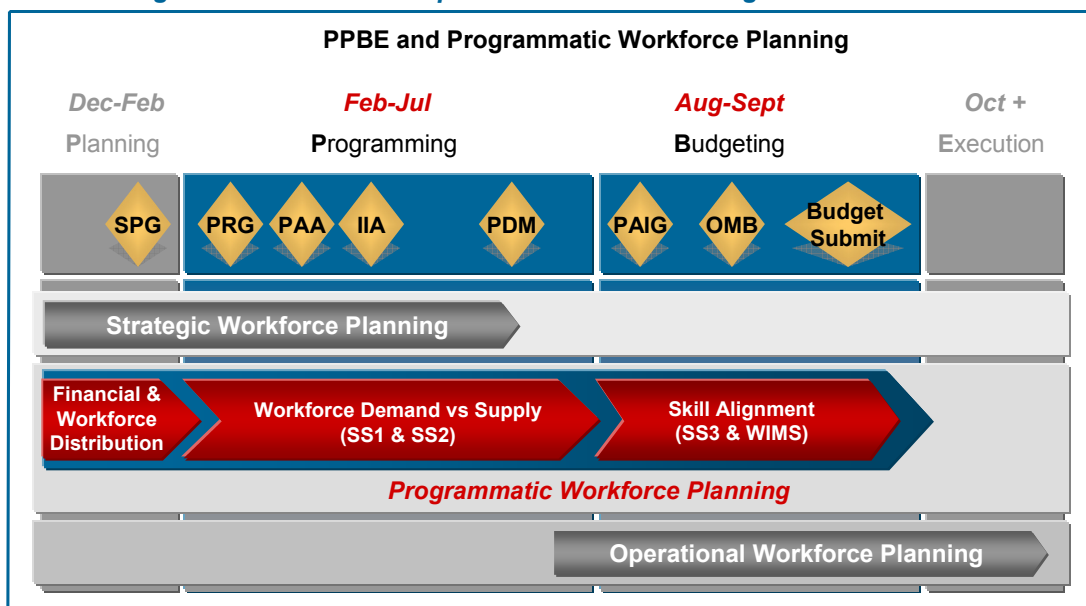
The workforce planning steps in the programmatic phase focus heavily on measuring workforce capacity misalignments at Centers. PWFP focuses on a capacity gap analysis using multiple events—workforce snapshots and WIMS submit—to refine the analysis over a defined period of

⁹ Appendix E provides additional details on the roles involved in Programmatic Workforce Planning.

¹⁰ The complete series of steps in the PPBE process are presented in detail in Appendix C.

time. As summarized in Figure 7, all of these exercises follow the traditional demand/supply gap formula, where demand is represented by a summary of FTE requirements from programs, supply is represented by current workforce plus future attrition and hiring, and gaps are the mathematical differences between the two. However, the main purpose and the level of detail vary from one event to another.

Figure 7: Workforce Snapshots and Labor Pricing as Part of PPBE



At the beginning of the budget planning process, details about the Program/Project work are still being formulated; therefore, the analyses that are conducted in the early stages are designed accordingly, focused on identifying alignment issues at an aggregate level. As the Program/Project information becomes clearer and the budget planning process moves farther along, the workforce demand vs. supply analyses become more specific, culminating in skill alignment analyses. This timeline of workforce planning analysis provides the necessary information at key times in the budget planning process to problem-solve misalignments along the way, rather than uncovering them toward the end of the budget process when major shifts (e.g. work distribution) would be more difficult to make.

In the following section, each major analysis activity is outlined, describing the timing, objective, analysis elements, and outcomes associated with each step. Additional Center level analyses are also described to provide further information about the kinds of workforce planning activities that occur across the Agency during in Programmatic Workforce Planning.

Funding and Work Distribution

In the very early stages (January/February) of the PPBE process, the Mission Directorates and Programs distribute work packages that describe, quantify, and obligate FTE (civil service resources) and WYE (contractor resources) they plan to “buy” from each Center. This step initiates the iterative process of negotiation between the Programs and the Centers regarding resource levels and work requirements. During this time, OHCM initiates an evaluation of the distribution and mix of work across Centers. The objective of this evaluation is to determine if

allocations of budget and support from Directorates to Centers is appropriate, given Centers' fixed workforce size and current composition. When looking at the mix of work, OHCM evaluates:

- Total FTE demand by MD, Program, Project
- Proportion of Firm vs. Forecasted
- Proportion of work at each Center from each MD
- Amount of Exploration work distributed to each Center

In addition to evaluating distribution and mix of work, OHCM seeks to determine the proportion of each Program's available vs. planned funds to determine the degree of funding held back, and compares that information to the amount and type of work the Centers expect to receive. The results of these analyses are communicated at the Agency level so agency leadership can help resolve issues related to work distribution early in the PPBE process.

Workforce Demand vs Supply

In the March-May timeframe of the PPBE process, the Programs/Projects and Centers are fully engaged in negotiation regarding FTE/WYE levels and work requirements. Centers are conducting analysis to determine if they are likely to have excess work or AFNW across the budget horizon, based on work that has been allocated to date by the Programs/Projects.

In this timeframe, OHCM solicits information from the Centers regarding the balance between the work that has been allocated and the Center FTE ceilings for civil service workforce. The objective of this step in the process is to uncover possible issues with distribution and work across Centers early enough in the process to make course corrections at the Agency level to avoid major misalignments between the assignment work and the workforce available at the Centers. These course corrections may include redistribution of work from one Center to another or identification of funding not yet allocated, and/or change to funding amounts within appropriations (where Agency has authority to do so). At the Center level, course corrections may include defining workforce requirements with more fidelity for any given package of work, pursuing potential work assignments for the Center, and/or redistributing MD ceilings within a Center

The data call to the Centers comes in the form of "Snapshots", which are specially designed excel-based workbooks used to gather information that is not readily available in other workforce planning systems. Snapshot One (SS1), executed in the March timeframe, focuses primarily on workforce demand, exploring the impact of unassigned or re-assignable work on Centers total gap/surplus condition. Specifically, SS1 asks the Centers to:

- Validate Program assignments and collect a list of unassigned work or assignments in negotiation
- Calculate total Center gaps/surpluses using alternative supply assumptions (e.g. prior FTE ceilings or targets, current FTE levels)



Snapshot Two (SS2), executed in the May timeframe, focuses again on workforce demand, but at a greater level of detail than SS1, exploring the impact of unassigned or re-assignable work on Centers gap/surplus condition at the organizational level (e.g. Engineering Directorate). Additionally, SS2 asks the Centers to:

- Assess the degree of certainty of Programs' FTE requirements and Program schedules, and identify errors in the data
- Identify additional program work that is not yet in the planning system but may be under negotiation with Programs and projects, and reimbursable work (which can be pursued by Centers in addition to NASA-funded work)
- Assess the fidelity of their own workforce estimates for any package of assigned work (e.g., have the estimates been artificially constrained by ceilings)
- Extent to which changes to work volume, workforce estimates, or schedules could be absorbed by the Center without additional problem solving at the Agency level (e.g., dialing support service contractors up or down, outsourcing or in-sourcing work)

Workforce Skill Alignment

In the August-September timeframe of the PPBE process, the Programs/Projects and Centers are winding down their negotiation regarding FTE/WYE levels and work requirements. Centers are conducting more detailed analyses to determine the degree of alignment between the work requirements and the skills of their current workforce.

In this timeframe, OHCM solicits information from the Centers regarding skill mix issues they will face over the planning horizon, given current hiring controls, Center ceilings, and work assignments from Programs. The objective of this step in the process is to identify significant workforce alignment issues at Centers that were not evident in the previous Center-wide FTE-focused analyses. These analyses may result in course corrections to include reformulation of hiring controls, development or alteration of sourcing decisions (e.g., support service contractors or other partners), and/or other workforce shaping efforts such as managing surplus through attrition.

Snapshot Three (SS3), executed in the August-September timeframe, focuses on workforce supply, examining how well the workforce matches the assigned work (e.g., skill mix issues for individual types of workforce), and on competed work that is a priority for the Center.

SS3 asks the Centers to:

- Use WIMS (Workforce Integrated Management System) to match workforce to work assignments (the portfolio of which is considered to be more settled by this point in the process). Specifically, WIMS requires Centers to:
 - Input workforce requirements data for current, present (current + 1), and budget (current + 2) years by work breakdown structure (WBS) code for every employee at the Centers

- Define work in terms of competencies by tracking each CMS competency that each employee will use and how much time the employee will spend on this work over the coming two fiscal years
 - Track people who are available for new work (AFNW) and the expected time and duration of this availability
- Provide additional narrative interpretation of detailed gaps and surpluses that result from the WIMS/WPS submit
 - Assess possibility to address gaps by acquiring or developing staff
 - Identify surplus that can be absorbed through attrition, incorporating Centers' own insights into likely turnover rates
 - Assess impact of unresolved workforce gaps or surpluses

WIMS planning is most effective when work requirements are clear. This level of planning enables Centers to check the assumptions used in the higher-level estimates and uncover additional capacity misalignments (e.g., gaps or surpluses in particular skills, competencies, or organizations).

Other Types of Center-Level Analysis

The workforce planning analyses in the programming phase also expand beyond the traditional capacity gaps and surpluses. For example, Centers determine if there are “partial” workforce to work misalignments of discrete knowledge, skills, experience, or proficiency. They also interpret gaps and surpluses, examining the probability that the misalignments will occur, the level of risk posed to the enterprise, and their ability to resolve issues independently. Finally, Centers assess their ability to meet longer-term strategic goals and objectives established by the Agency, such as perm/term mix and scalability. The strategic workforce health measures are included in this phase because they provide insight into these kinds of workforce issues and provide a fuller view of the Centers' overall workforce status.

Findings from these additional types of analyses can generate other, often Center-driven, problem-solving activities. Centers can initiate changes to hiring priorities, revise deployment arrangements (e.g., migrate workforce to new work to build skills), develop approaches to work performance (e.g., new kind of team-based collaboration), reorganize, or alter how support service contractors are used.

Formulating the Labor Budget

Throughout the budget cycle, multiple FTE ceilings exist for the centers: Center ceilings (from OCHM), Project Ceilings (from N2), and internal organization ceilings. All these should be reconciled and priced out at some level, depending on the data requested for senior management to make informed decisions and respond to external inquiries with consistency and data integrity.

Snapshot 3 informs the Agency of the estimated demand-driven FTE requirements at the Center level. Because Center FTE levels cannot be altered quickly, it is necessary to smooth out ceilings so they do not abruptly increase or decrease. Therefore, Snapshot 3 is used to determine new ceiling controls that are used to generate labor pricing costing using the WIMS Labor Pricing



Module (LPM) (see description on page 55). This upload represents the labor portion of the budget submit that is shared with OCFO budget analysts and submitted to OMB and Congress.

WIMS is a single integrated source for all workforce planning, management and analysis data for the Center and Agency. One of the several modules within WIMS is LPM (Labor Pricing Module). The LPM is an integrated Agency wide workforce budgeting tool that has been developed for the NASA Labor Budget Analysts (LBAs). LPM can be coupled with the Workforce Planning System (WPS), the workforce planning module within WIMS and used in center unique budget systems that also include travel and procurements.. LPM combines FPPS and ALDS data with WPS FTE/WBS planning data to identify the cost to project civil servant labor and labor related costs.

LPM is automating the labor pricing process across the Agency with the intent to minimize the use of numerous complex spreadsheets and provide a consistent calculation solution and process. In addition, one of the values of LPM is the ability to perform “what if” scenarios with the same assumptions, using the same dataset.

The goal of LPM is to create a “single entry point for LBAs to obtain labor costs. This single automated solution will provide a uniform labor calculation solution available to other modules requiring labor data.

5.6 REPORTS AND OUTPUTS

A number of outputs and reports are generated as part of PWFP:

- ▶ **Work products generated during the PPBE cycle** (e.g., three workforce snapshots and a WIMS submit) that contain both quantitative and qualitative elements
- ▶ **Labor portion of the NASA budget**, which is submitted to OMB and Congress
- ▶ **Documented agreements** (e.g., program decision memoranda [PDM]) and published directives or guidance (e.g., memoranda about Center FTE ceilings)
- ▶ **Summaries of unresolved issues** (e.g., remaining AFNW at Centers)
- ▶ **Revised budget guidance for bottom-up deployment planning** that transitions planning from the programmatic level to the operational level
- ▶ **Communication documents for internal and external audiences** that summarize findings, recommendations, and open issues

5.7 RELATED POLICIES

The PPBE guidance documents, including the *Strategic Planning Guidance*, the *Program and Resources Guidance*, and the *Program and Institutional Guidance* are mechanisms for conveying workforce planning policy to the Agency. The instructions and parameters laid out in PPBE documents are developed in each cycle with input from a range of Agency and Center stakeholders. PPBE policy documents are controlled, and are accessible online via the eBudget Clearinghouse.



Acquisition Strategy Policy and Programmatic Workforce Planning

Strategic acquisition at the Center level is concerned primarily with the criteria that a Center should use to decide if it should use support service contractors or maintain a capability or competency in-house. Because MDs, MSOs, and Centers are each responsible for implementing the Agency acquisition strategy policy, acquisition planning allows senior Center administrators to make informed and data-driven decisions about outsourcing of functions in a manner that supports the NASA mission as well as the business requirements of the Center. These decisions are based on a number of factors, including the level of in-house capabilities, the emergence of newly required capabilities or the disappearance of outmoded capabilities, and the costs associated with maintaining capabilities in-house versus the costs of outsourcing the work.

— Did you know? —

To access Clearinghouse, you must first log in to the eBudget application, at <https://budget.nasa.gov/login/Login.aspx>. If you do not have access to eBudget at this time, or if your account has expired, you will need to request a new eBudget account via a NAMS request. You may go to <https://nams.nasa.gov> to initiate a request. A user guide to help you request the appropriate access has been posted on the eBudget i-View page.

6. Operational Workforce Planning

6.1 DEFINITION

Operational Workforce Planning differs from Strategic or Programmatic Workforce Planning in its short-term planning horizon (0–1 year) and its focus on the civil servant workforce as opposed to the total workforce.¹¹ Also, Centers rather than Agency or Program organizations are primarily responsible for performing Operational Workforce Planning activities.

NASA's definition of Operational Workforce Planning emphasizes these themes—

Operational workforce planning is the discipline of assigning current Center workforce to work requirements over a one-year time frame, managing the distribution of workforce across the Center according to agreed Center resource levels, and supporting the institutional health of the Center's civil service workforce.

Within the discipline of Operational Workforce Planning (OWFP), NASA Centers perform a number of different types of tasks:

- ▶ **Assigning current workforce to work (i.e., a deployment plan)**, an imperative task given the highly matrixed organization structure of most Centers, where civil service workforce and support contractors work on multiple projects concurrently.
- ▶ **Implementing workforce changes agreed to during Programmatic Workforce Planning** (e.g., increasing or decreasing overall Center FTEs or developing current workforce by cross-training to a new type of work)
- ▶ **Ensuring the proper mix of workforce attributes** — Centers verify that they have the right quantities and combination of competencies, skills, appointment types, and so on to perform current and future work.
- ▶ **Managing the use of FTEs at the Centers** – Centers ensure that they obtain and maintain the needed amount of employees within the established Center ceiling. Planning and management of FTE relies on a well-established tracking and phasing process. It starts with both the Center FTE ceiling issued by HQ OHCM and with individual organization ceilings that Centers themselves establish and track. It ends with the creation and maintenance of the hiring phasing plans, implemented in collaboration with human resources staff and with the hiring Directorates.

¹¹ Most planning for the contractor workforce takes place within Strategic and Programmatic Workforce Planning. Operational Workforce Planning does incorporate information about established on site and near site contractors and how they can be used to supplement the civil service workforce.

Centers must coordinate their operational tasks because decisions made in any one area can affect all other areas. For example, Centers must conform to FTE ceilings that, along with attrition, define the amount of hiring that is possible at a Center. Centers also must use hiring opportunities to make good decisions about the proper mix of workforce attributes to fulfill current and future mission needs, which in turn impacts the workforce available to assign to work.

6.2 DRIVERS

OWFP focus on implementation (i.e., making workforce changes happen and assigning workforce to perform work) means that the driver behind this type of planning is the need to ensure Centers successfully accomplish their work and attain their goals and objectives. Although NASA has been conducting OWFP activities since its inception, this type of planning has become more complex and important as a result of the following:

- ▶ The Agency has commenced new exploration projects and Centers now must develop operational workforce plans that meet multiple, sometimes competing, objectives. For example, Centers must have resources to perform work for particular MDs right now while altering its composition to anticipate and prepare for future requirements.
- ▶ A “business-as-usual” mode of planning and operating is no longer reliable, and Centers must put more effort into planning, rather than letting things work the way they have previously.
- ▶ There is not much room for error. Funds to cover cost or FTE overruns ultimately come out of a fixed budget, thus delaying spending on other things of importance to the Agency.
- ▶ Areas of renewed interest to the Agency, such as preserving in-house capability or workforce bench strength, ultimately play out at the OWFP level in the form of hiring, training, or deployment plans that Centers can implement. Therefore, Centers must be able to convert broad, sometimes conceptual, objectives into tangible plans.

The six Measures of Workforce Capability (Part 4, Strategic Workforce Planning), reflect the range of topics that Centers must consider when developing operational workforce plans.

6.3 OBJECTIVES AND OUTCOMES

The general objective of OWFP activities at each Center is to manage the Center’s civil service workforce by—

- ▶ Translating multiple, concurrent short- and longer-term workforce objectives into concrete actions, and implementing them
- ▶ Monitoring progress against plans and making adjustments as needed
- ▶ Deploying workforce to perform work
- ▶ Conforming to Agency policies, directives, and agreed resource ceilings



Within these general objectives, more detailed objectives form the basis of OWFP activities, such as—

- ▶ Conforming to FTE ceilings by balancing the pace of hiring over the course of the fiscal year against actual and projected losses
- ▶ Increasing workforce scalability through appropriate distribution of permanent, term/temporary, and student employees
- ▶ Using hiring authority effectively, taking into account long- and short-term requirements, and effectively applying flexibilities and incentives
- ▶ Maximizing buyout authority through appropriate definition and sizing of the target population
- ▶ Improving long-term workforce sustainability by establishing robust pipelines for positions needed in the future:
 - Capitalizing on student and “fresh-out” programs—Centers must size their student programs (e.g., Student Career Experience Program [SCEP] and Federal Career Intern Program [FCIP]) to correspond to future entry-level needs in key areas such as engineering and professional administrative positions.
 - Building skills in pipelines staff—Centers must provide hands-on work opportunities, using senior staff to help train and transfer knowledge to rising staff members, and offer other training and development activities.

6.4 PROCESS PARTICIPANTS

OWFP occurs at the Center level and typically works within the structure of Center organizations and organizational sub-elements, not through the program/project structure that characterizes PWWP. Participants in the Operational Workforce Planning process include the following:

- ▶ Agency OHCM, Workforce Strategy Division, which issues Center ceilings
- ▶ Workforce planners, at Center workforce planning offices (in the human resources office or in the chief financial officer’s organization) or within organizations, who create and update plans and analyze actuals and current supply data
- ▶ Center line organizations, including administrative officers, who verify and validate Center plans
- ▶ Human resources specialists, who manage hiring actions, buyouts, and other such actions, based on workforce plans, and who provide needed information to workforce planners to develop and keep current viable plans.¹²

¹² Appendix E presents additional details on the roles involved in Operational Workforce Planning.

6.5 DESCRIPTION OF PROCESS

OWFP covers many different activities because it is in this area of planning that all of the objectives, goals, and findings from all other types of workforce planning converge. Although Centers differ in how they perform these activities, they cover all of the activities following the processes described in this Section.

OWFP process is composed of the following three interrelated areas:

- ▶ **FTE Controls and Flow of Workforce**—Refers to ceilings and hiring controls and to calculations of the flow of workforce in terms of hires and losses using these constraints. This area also includes tracking of actuals for compliance with ceilings.
- ▶ **Workforce Deployment**—Assignment of people to work in the form of funded projects.
- ▶ **Implementing HC Changes**—Assessment of institutional health and implementation of changes in the types of workforce, capabilities, and structure that are needed at a Center.

— Reference —

Three primary activities that drive operational workforce planning -- managing FTE controls and flow of workforce, workforce deployment, and the implementation of HC changes -- are not completed in a sequential or linear manner but in parallel with integrated activities. The intersection of the data, analysis, and outputs of each activity form the foundation for operational workforce planning.

Each Center designates specific staff to perform the work in each of these three areas. Each area, however, relies on inputs from or must provide outputs to the other areas for the planning to achieve its intended outcomes. For example, workforce deployment plans cannot be constructed without FTE controls for individual Directorates or offices. Human capital changes, such as increases or decreases in the number and types of positions or development of the current workforce, depend on both deployment planning and its output.

The remainder of Section 6.5 describes in detail each of these three areas Section 6.5.1, FTE Controls and Flow of Workforce; 6.5.2, Workforce Deployment; and 6.5.3, Implementing Human Capital Changes.

6.5.1 FTE Controls and Flow of Workforce

Agency FTE Controls

At the close of the annual budget cycle, the Agency presents the budget submission to the OMB, which controls federal employment by establishing FTE workforce limits, or ceilings, for government agencies for the upcoming fiscal year plus the remaining 5 years of the budget horizon. OMB reviews the budget submission and assigns NASA a total FTE ceiling or “target” for the civil service workforce at the Agency.

Only OMB can change the total NASA FTE target but NASA HQ can adjust Center ceilings within that total to respond to mission requirements. Center FTE ceilings are finally published in



a Program Decision Memoranda (PDM). Subsequently, they are updated through the year by memoranda via the Agency Associate Administrator.

The Center FTE ceiling is the resource constraint within which OWFP occurs at the Center level. Other constraints on Center-level workforces come by way of hiring restrictions that are issued by NASA HQ for Centers whose ceilings are declining. Examples of such hiring restrictions include the following:

- ▶ *Hiring Freeze*—Hiring freezes vary in their formality, rigidity, duration, and scope. Some are initiated by OMB, while others are initiated by Agency or Center management. A freeze on hiring is for reducing staff by not replacing departing employees. Freezes also prevent the Agency from incurring the costs associated with a RIF.
- ▶ *Replacement Hiring Restriction*—Hiring may be restricted to ensure that Centers are able to conform with shrinking ceilings from one year to the next. For example, the new exploration projects have been accompanied by shrinking ceiling levels at some research Centers. To ensure that these Centers were able to meet future FTE ceilings in 2007, the Agency imposed a 1:3 replacement hiring restriction on these Centers where for each three employees lost, these Centers may fill only one position.

Center FTE Controls: Directorate Ceilings and Hiring

Centers are free to determine how to implement the ceilings and hiring constraints issued by the Agency. A key aspect of this implementation is the distribution of FTE across the Center through assignment of Directorate- or office-specific ceilings. These organization-specific ceilings serve as a starting point for operational planning; they may be adjusted during the year as actual losses occur and as new information becomes available.

Center organizations use ceilings as control totals and request authority for new hires based on projected loss rates. Their hiring requests are based on their own gap analyses, using workload requirements allocated from Programs and projects (usually documented in WIMs or other Center-based systems). They also factor in the need to change skill mix and other workforce health considerations.

Because Centers have greater control over hires than over losses, Centers have well-established processes for managing the flow of new hires. These include an approval process for filling individual positions and a tracking and phasing process to determine when hires should be made. In most Centers, approval to hire is delegated to Directorates and Directorate-level offices, within the limits of their ceilings. The assumption underlying this approach is that decentralized decision-making and prioritization is most responsive to the kinds of work coming into the Center.

Some Centers take a more centralized approach to approving new hires. This is often the case when Centers are responding to either significant constraints on hiring or significant shifts in mission and role. In cases where hiring is limited to less than one-to-one replacement hiring, Centers often make tradeoffs between backfills in different Directorates. Another situation that might drive centralized decision-making is a significant shift in the Center's role or work. A change of this type might require the Center to reconsider ceilings allocated to Directorates. This

reconsideration can take the form of case-by-case decision-making or a wholesale change to Center ceilings.

FTE Tracking and Phasing

To ensure compliance with Directorate and Center ceilings, Centers establish phasing plans for the timing of new hires against losses and a tracking plan for monitoring levels throughout the year so that necessary adjustments can be made. The basic components of tracking and phasing plans include the following:

- ▶ Directorate-level ceilings
- ▶ Projected attrition rate (e.g., through resignation, retirement, buyout)
- ▶ Additions to their workforces within ceiling and hiring constraints
- ▶ Timing of attrition and hiring activities (employees who leave before the end of a year, hires who start later than the beginning of the year, and gaps or overlaps in filling positions, all factor into the FTE calculations used to compare to Center ceilings).

Tracking and phasing full-time permanent employees (FTP) can begin by using a simple spreadsheet, setting up a phasing plan for bringing employees into an organization, and then tracking FTE on an ongoing basis and updating actuals to adjust the phasing plan.¹³ Key concepts included in the tracking and phasing of a Center's workforce include the following:

- ▶ Understanding the definition of FTE as “full-time equivalent” – for example, when equating 2,080 hours per year to an FTE, an employee who takes six months of leave is considered 0.5 FTE.
- ▶ Calculating FTE by understanding its relationship with employee types (i.e., FTP and other than full-time equivalent [OTFTP]) – for example, a part-time permanent employee working 20 hours per week is considered 0.5 FTE.
- ▶ Understanding the importance of phasing and its impact on FTE calculations – for example, a Directorate can stay within an FTE ceiling by phasing the rate at which employees are hired to balance against the attrition rate.
- ▶ Understanding how to assess if an organization is or is not on track to stay within its ceiling – for example, analyzing FTE “burn rates¹⁴” or managing onboard targets.

When tracking and phasing the workforce, the Federal Personnel Payroll System (FPPS) is used as the source of actuals data for current levels at any point in time. Current employment levels are calculated by identifying FPPS loss actions (e.g., resignations, reassignment out, and sometimes loss without pay) and gain actions (e.g., hire, reassignment in) so that Centers can calculate current employment levels and compare them with ceilings to generate or alter phasing plans. Other types of FPPS personnel actions that must be counted carefully include conversions from one employment type to another (e.g., students to permanent, or full-time to part-time) or incidental leave without pay amounts, which can add up to large amounts over the course of a year.

¹³ Appendix F provides an example of how a spreadsheet can be used to track and phase employees.

¹⁴ “Burn rate” refers to the rate with which Centers have used FTE in a year.



Creating Staffing Plans

The elements discussed so far in this section are combined to create Directorate-specific and Center roll-up staffing plans that take into account the following:

- ▶ Current and future ceiling levels, including over-guideline requests or other anticipated changes
- ▶ Onboard employee levels
- ▶ Projected losses and timing
- ▶ Hiring requests and timing (e.g., carryover hires from prior year approved but not yet implemented).

Centers consolidate this analysis and create separate staffing and phasing plans for each of the following key employee types:

- ▶ Full Time Permanent (FTP) employees (plans assume employees work 80 hours each pay period)
- ▶ Other Than Full Time Permanent (OTFTP) employees (plans may use an historical average of hours each pay period for each type) – OTFTP types include:
 - Temps/term employees
 - Part-time employees (or employees in a part-time permanent [PTP] status) typically work 32–64 hours per pay period
 - Student program employees may work a full-time or part-time schedule; at some Centers, students work 2,080 hours per year and also attend school.

These staffing and phasing plans include the number and phasing of hires and losses in each Directorate. If decision-making is decentralized, then a Center can start with an overarching plan that is disseminated to each Directorate before Directorate-level plans are rolled up to create a consolidated Center-level plan. To create Directorate-level plans, Centers start with key targets, such as the number of employees onboard and FTE ceilings. The plans take into consideration any changes in the total ceiling allocated to the Center. If the ceiling for the organization is stable, the organization can expect to be planning replacement hiring. If the organization is growing to a higher ceiling, then planned hires may exceed losses; if it is shrinking, the opposite is true.

In the beginning of each year, historical data are used to develop an estimate of how many losses can be expected.

— Example —

One way to conceptualize a phasing plan for staffing is to start by thinking of it in terms of on-board (or, whole) employees. If a Directorate begins the year with 90 full time on-board employees, and in the average year it has 20 losses, and its ceiling is static at 100 on-board FTP, then it could potentially have 30 hires. The directorate would plan its hires to balance losses over the year, and it would not plan hires that would take it over its ceiling.

However, a Directorate would not typically *have* an on-board FTP ceiling. Rather, the ceiling is issued in terms of full-time equivalent (FTE) FTP. This ceiling would be a



component of the Center's FTE ceiling, which in turn is a component of the FTE ceiling or target that OMB gives NASA. The significance of planning to an FTE ceiling (as opposed to an on-board ceiling) for the Directorate is that it must account for the time when it is not burning FTE. This includes the lag time between when current employees leave the organization (losses) and when new employees are brought into the organization (gains), as well as the Directorate's aggregate leave without pay (LWOP).

It is necessary to use a spreadsheet to build an FTE phasing plan, and a simplified example of one appears in Appendix F. As the Directorate with a static ceiling of 100 FTP *FTE* plans the phasing of its hires in the spreadsheet, it no longer needs to plan its gains to immediately follow its losses. In fact, gains may precede losses (the timing of losses is inherently difficult to predict). The Directorate's FTE burn rate might temporarily exceed its FTE ceiling for the year, but this is not a problem if its phasing plan is taking into consideration dips in the rate of FTE usage at other times in the year. Of course, the directorate's phasing plan must be put together taking into consideration the burn rate of the Center. The directorate could not arbitrarily increase its number of losses to enable it to have more gains. The Directorate also cannot plan hires that would position it so that it would not be able manage within its FTE ceiling in the following year. A goal would be to end the current fiscal year with an on-board FTE equivalent that does not exceed the next year's ceiling by more than a small percentage at the Center level. This will enable organizations to hire in the first quarter of the fiscal year.

If any hiring restrictions are in place, then replacement hiring must be adjusted to accommodate them.

— *Example* —

A Center that normally has 195 losses per year and that now has a 1 hire for 3 losses restriction could plan only 65 hires during the fiscal year.

Centers may want to revisit and perhaps rephase their planning in April, in advance of the upcoming end of the fiscal year. If a Directorate has many more losses planned and it does not know of projected losses, then it would be a good time for it to work with workforce planners to adjust its plan. If the Directorate has had losses above the planned level, then hires can be added back in.

If the Center is too close to its ceiling in August, then approval for some hires may need to be “pulled back,” meaning that the approval may have to wait for the next fiscal year, which begins in October. In a normal year, the phasing plan will control when hires come on board, but these hires may be delayed due to ceiling constraints, backfill restrictions, or delays in the staffing process.

Time to fill durations in federal staffing and recruitment processes often are difficult to predict. The more closely workforce planners collaborate with human resources representatives, the greater the likelihood that organizations will succeed in implementing (and adjusting as needed) their plans.

— *Center Example* —

Directorate FTP and OTFTP staffing plans initially are developed in the OHCM workforce planning office. A workforce planner collaborates with the Directorate to

make the plan more accurate (e.g., known projected losses are placed when they are expected to occur, and hires are spread to meet Directorate requirements and to ensure usage of FTE at a level that the ceiling can handle). The plans are on a shared drive, and Directorates have access to their own plans. Each pay period, OHCM or the Directorate updates the plans with actual losses and gains (with employee names) and updates the FTE hours burned. The plan spreadsheet calculates the FTE that would be burned by the end of the year (annualized). Directorates update their known and suspected losses. The Directorate plans roll up to a Center plan that is maintained by OHCM. Directorates at this Center maintain student staffing plans, which are not tracked as closely as the other plans at the Center level.

Students work very varied schedules as they cycle between work at the Center and full-time schooling. An average number of hours worked for Co-Ops and Stay in Schools is used to determine the ceiling. This Center commits a pool of FTEs to student hiring based on a fresh-out strategy designed to ensure the long-term viability of student programs and an adequate supply of fresh-out hires in the future.

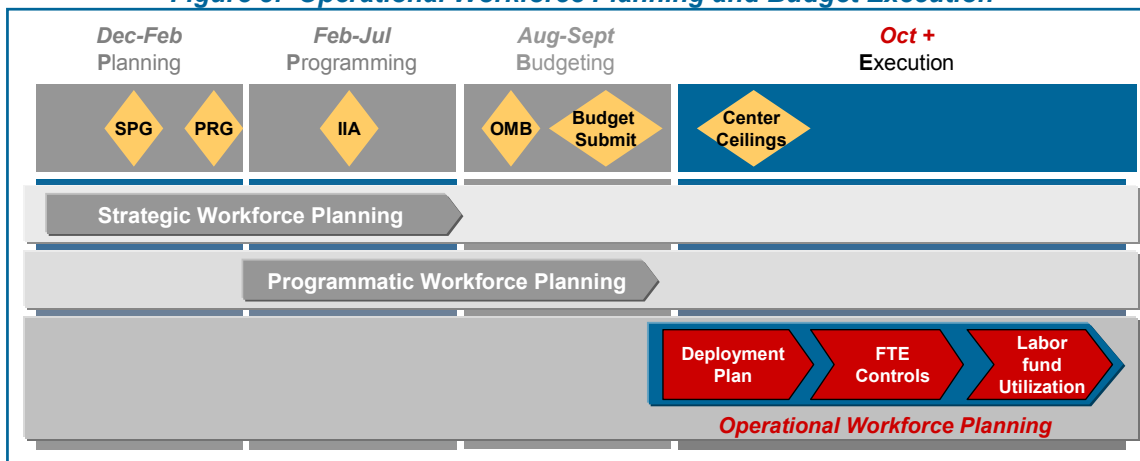
The process described above is a traditional approach to managing OWFP. Centers may also apply predictive techniques to generate improved FTE forecasts. Center phasing plans, for example, allow Centers to phase out FTE ceilings provided by the Agency. In this way, employee headcount adjusts to the ceilings provided over the course of the year.

In conducting trend analyses of current and historical workforce data, some Centers review workforce trends (e.g., attrition, accessions, and retirement eligibility) and generate forecasts (and regressions) or averages with these data. The analyses that produce retirement and attrition projections allow Centers to better capitalize on available data while improving their estimates of FTE requirements, ultimately allowing Centers to produce better estimates for the PPBE process.

6.5.2 Workforce Deployment

The workforce deployment area of planning consists of the planning, tracking, and managing of employee assignments to funded work, and is a direct outflow from the PPBE process, as illustrated in Figure 8.

Figure 8: Operational Workforce Planning and Budget Execution





The final version of WIMS submitted at the end of the budgeting cycle in early autumn includes a sample deployment plan. Centers use WIMS to match individual people to funded work, based on descriptions of work requirements captured in the WIMS Program/Project Requirements Library System (PRLS) module or similar Center-based systems.

The preliminary deployment plans represent a starting point for detailed deployment planning that takes into account the following:

- ▶ Center and Directorate ceilings
- ▶ Estimates of losses and hiring requests (as included in staffing plans)
- ▶ Timing of hires and losses (as included in staffing plans)
- ▶ Availability of support service contractors
- ▶ Potential increases or decreases in existing work
- ▶ Work that may be won through competition
- ▶ Requirement to supply hands-on training for employee development purposes.

These deployment plans match employees to work based on their availability and skills, and identify contingency plans for changes that could occur. Note that deployment planning expands its focus to include the contractor workforce. This expanded focus is necessary because contractors play a vital role in allowing Directorates to provide supplemental labor for projects. Directorates increase or decrease contractor capacity in response to unanticipated changes.

Like staffing plans, deployment plans are monitored and revised as necessary throughout the year. For example, changes in work or actual losses and gains in the number of employees unforeseen by a Directorate, can alter who is assigned to what work. In addition, budget analysts associated with Programs and projects track utilization of contractor and civil service labor funds and identify actual or projected underruns or overruns. These issues are resolved in a variety of ways, but can impact the amount of labor associated with a project, thus affecting the deployment plan.

Deployment planning is often performed by Directorate or office staff, with input from workforce planners. As a result, there are many different approaches to deployment planning. Some Centers leave Directorates free to create their own deployment plans; other Centers centralize the planning. Some Centers update centralized databases such as WIMS; others do not prescribe any one tool for this purpose. The wide variability in the processes used by the Centers and MDs made it impossible to include a description of one representative process in this document.

6.5.3 Implementing Human Capital Changes

This area of planning is the least concrete and linear of the three areas of OWFP because Directorate, human capital, and workforce planning staff share responsibility for it. OWFP serves an important purpose – turning outputs of Programmatic Workforce Planning into actionable events and determining the following:



- ▶ In what areas of the organization or workforce to make cuts in response to declining ceilings
- ▶ In what areas of the organization or workforce it is most important to make additions, in response to increasing ceilings
- ▶ Position design for new hire positions
- ▶ Which hires are most critical, in the event that hiring is limited further
- ▶ How to improve the skills of existing workforce through on-the-job training, promotions, and other mechanisms
- ▶ Whether to hire new staff into junior, mid, or senior levels, taking into account what is needed to perform work and maintain bench strength in the future
- ▶ How to solve project performance issues using contractor staff or other borrowed staff

This list is not comprehensive; rather, it lists the types of human capital changes that are needed to achieve short-, medium-, and long-term goals. Not all workforce issues flowing from the programmatic phase are included in the operational phase for any given year because some actions do not need to start immediately. There are, however, a number of actions that may need to begin even if the benefits of implementing them are not immediate. For example, Centers may make critical hires to develop new capabilities in preparation for work that begins one or two years later.

These human capital changes are implemented using staffing and deployment plans drafted by workforce planning and Directorate staff, as well as other human capital plans such as training and succession planning.

6.6 ANALYSIS

Within the FTE ceiling allocated to a Center, OWFP at each Center considers the supply of current and planned employees in terms of several attributes. For example, Centers are concerned with—

- ▶ Skills and competencies of employees
- ▶ Positions that they hold
- ▶ Whether or not the positions feed a pipeline to other positions
- ▶ Whether employees are on permanent or temporary appointments

This section addresses five aspects of OWFP analysis: competencies, student pipeline, perm/term, position management, and human capital workforce interventions. Some areas (e.g., competencies and pipelines) can become extremely complex; the examples in this section are intended to be introductory and not exhaustive in their treatment.

6.6.1 Competencies

Centers must determine what skills and competencies at the individual employee level are critical for performing ongoing work in support of the Agency mission. The starting points for

these determinations are Agency and Center-level strategic and mission planning. As part of these planning processes, the Centers shape their roles as providers of capability supporting the NASA mission. At the Center level these capabilities are commonly referred to as *core competencies*, not to be confused with the individual competencies of employees.

Centers typically have a clear understanding of the core competencies that they maintain and sustain through their workforce. For example, as part of the FY09 Acquisition Strategy Meeting, Dryden Flight Research Center (DFRC) identified its key capabilities as Atmospheric Flight Research & Test and Airborne Science Mission Operations. The Langley Research Center's (LaRC) key capabilities at that time were Aerosciences, Structures and Materials, Atmospheric Characterization, and Systems Analysis. The key capabilities drive the kind of projects and program work that the Center is assigned or wins. In this way, the capabilities shape the demand for workforce.

In OWFP, the Centers' core competencies are translated into key skills and competencies at the individual employee level. The Center, to plan for and perform its work, must understand several aspects of the individual competencies and skills that are required, such as:

- ▶ Required civil service competencies and proficiency levels
- ▶ When competencies and proficiency levels will be required
- ▶ Number of core permanent civil servants required to sustain each competency, as well as to meet new or unanticipated program requirements
- ▶ Succession plan needs for future leaders and key positions
- ▶ Appropriate number and mix of permanent and term employees.

Some of these minimum requirements for sustaining and/or growing competencies or positions will drive Center-level decisions about hiring priorities. At a minimum, the Centers review their own staffing plans to ensure that they have the bench strength necessary to perform their work. Information from the operational level about the current and projected supply of competencies feeds the Strategic Workforce Planning level when NASA's critical competencies (originally set forth in the *NASA Workforce Plan*) are updated.

6.6.2 Workforce Pipeline Programs (Civil Service Student)

Centers utilize many career pipelines within their workforces. Civil service student programs are the most visible pipeline at most centers. Centers typically manage the FTE ceiling for student programs that serve as pipeline positions separately from other time-limited appointments. Although intermittent leave without pay (LWOP) may make student FTE burn rates difficult to project in any particular pay period, Centers can take an annualized view, and allocate a specific number of FTE outside of the ceiling and dedicate these to student programs.

The Student Career Experience Program (SCEP), which includes the Cooperative Education Program, is the primary student program serving as a workforce feeder at most Centers. SCEP permits students who complete on-the-job work-related training and education requirements to be converted non-competitively to full-time positions in the competitive service.



NASA also has other career post-degree programs, geared primarily to college graduates. Although such programs have fewer participants than SCEP, they also serve as feeders into the NASA workforce by allowing non-competitive conversion to positions in the competitive service:

- ▶ **Federal Career Intern Program (FCIP)**—NASA uses the FCIP to recruit and attract exceptional individuals with undergraduate and graduate degrees into a variety of entry-level occupations at the GS-5, GS-7, and GS-9 levels. After successful completion of this 2-year development and training program, interns may be converted to permanent NASA positions.
- ▶ **Presidential Management Fellows (PMF) Program**—NASA uses the PMF Program to recruit and attract outstanding individuals at the GS-9 level with graduate degrees in a variety of academic disciplines and career paths who have a clear interest in the management of public policies and programs. After successful completion of this 2-year development and training program, fellows are converted to permanent NASA positions.

Centers must determine the scale of their participation in pipeline student programs based on their projected ability to hire the students that graduate from them. There is some flexibility with SCEP participants because students may be hired as term employees if the Center does not have enough ceiling to hire them as permanent employees (or it may decline to convert them). Planners, however, should note that PMFs must be converted to permanent positions, whereas the FCIPs can be either converted or not converted (therefore terminating NASA employment).¹⁵

6.6.3 Perm-Term

When an organization decides to hire a civil servant for a position, it must determine whether the type of appointment that will best meet mission needs is permanent, term or temporary:

- ▶ **Permanent**—The individual is hired to fill a "permanent position," which is defined as a position filled by an employee whose appointment is not designated as temporary and does not have a definite time limitation of one year or less (5 Code of

— Did You Know —

The February 2008 SPG states: "Centers will evolve toward achieving and maintaining a minimum profile of 15% term/temporary workforce for S&E positions by 2013 (not including students/co-ops). The purpose of this Agency target, which is a strategic one, is to increase the flexibility of NASA's workforce to:

- Dial up/increase in certain areas or skills (e.g., when there is a short-term need for extra workforce)
- Dial down/decrease in certain areas or skills (e.g., when program funding in a certain discipline is expected to end or severely decline)

¹⁵ In addition to these government-wide civilian student programs, several NASA-sponsored education programs (e.g., NASA Undergraduate Student Research Program and NASA Graduate Student Research Program) serve as feeders into the workforce pipeline. They are not addressed here because there is currently no Federal hiring authority to convert participants to career or career-conditional positions in the competitive service. Therefore, graduates of these programs can be considered potential members of the external applicant pool (for SCEP, FCIP and PMF programs, as well as for competitive appointments (e.g., career-conditional and term) posted on USAJOBS website); they are not considered current workforce that needs to be planned.

Federal Regulations [CFR] 531.403).

- ▶ **Term**—The individual is hired for work that is not permanent, but will last for more than 1 year and will not exceed six years (5 CFR 316.301). Reasons for making a term appointment may include project work, extraordinary workload, scheduled abolishment of a position, reorganization, uncertainty of future funding, and/or contracting out of the function.
- ▶ **Temporary**—The individual is hired to fill a short-term position to meet an employment need that is scheduled to be terminated within 1 year (with a possible extension of a second year) for such reasons as abolishment, reorganization, or contracting of the function, anticipated reduction in funding, completion of a specific project, or peak workload; or to fill positions on a temporary basis when the positions are expected to be needed for placement of permanent employees who would otherwise be displaced from other parts of the organization (5 CFR 316.401).

Centers must determine what mix of appointment types works best relative to the projected duration of any planned or current work. Any analysis would take into consideration permanent-to-term ratio targets that might be imposed by the Agency.

In 2007, the National Academy of Public Administration¹⁶ recommended that NASA consider several criteria in making tradeoff decisions between permanent and term appointments for employees. Following is a partial and summary list of these criteria:

- ▶ **Flexibility**—Does the work require employee stability or is it limited-duration work?
- ▶ **Function**—Is the work a core competency, needed to create a long-term institutional investment, internal capacity, or institutional knowledge, or does it involve strategic decision-making?
- ▶ **Recruitment Source**—Does the work not have a foreseeable end point and does the nature of the work require primarily a current federal employee, who is unlikely to accept a limited-duration appointment?
- ▶ **Resources**—Is the position a long-term priority and are projects stable for the required skill area?
- ▶ **Workload**—Is the projected workload stable, or does it require only a temporary workforce augmentation?
- ▶ **Labor Market**—Is the position or work location such that the best candidates will go elsewhere if a non-permanent position is offered?

Ratio of term-to-perm is the subject of increasing interest at the Agency. The Center must determine which work types, competencies, or positions should be more and less term, so that the Center as a whole reaches its target. This planning is operational because it requires the Center to look at specific jobs and work, although the planning is strategically informed.

¹⁶ Source: *NASA: Balancing a Multisector Workforce to Achieve a Healthy Organization*, National Academy of Public Administration, February 2007, pp. 154–157.

6.6.4 Position Management

OWFP analysis contributes to position management by providing information needed to make effective organizational design decisions. For example, workforce inputs to ensure that the organization is appropriately structured to avoid excess organizational layers (horizontal) and redundant operations (vertical) include the following:

- Statistics such as ratio of administrative jobs (e.g., mission support) to workforce
- Distribution of administrative jobs by Center and by geographical location
- Trends in numbers and proportions of administrative jobs.

6.6.5 Human Capital Workforce Interventions

Workforce analysis informs decision-making in human capital, and is often used to prepare a rationale for desired workforce actions. The following excerpt from NPR 3010.1, *Strategic Workforce Management Process: Tools and Strategies to Address Project Workforce Transition* (Figure 9), shows Center-level actions in light of increasing or decreasing needs in key positions/competencies.

Figure 9: Tools and Strategies Supporting Changes to Position and Competency Requirements

If need for positions/competencies <u>diminishes</u> in certain areas	If need for positions/competencies <u>increases</u> in specific areas
Buyout Authority and/or Early Retirement Authority <ul style="list-style-type: none"> ▶ Maximum use to create placement opportunities through attrition, <u>or</u> ▶ Targeted use to ameliorate competency imbalances 	Buyout Authority and/or Early Retirement Authority Targeted use to decrease FTEs in less critical competencies to provide room for increased hires in more critical competencies
Reassignments to funded vacancies within or between Centers as appropriate <ul style="list-style-type: none"> ▶ Directed, as well as voluntary ▶ Incentivized (relocation bonus) <ul style="list-style-type: none"> ▪ Telecommuting via administrative tools or collaborate engineering environment to another Center without a relocation 	Reassignment of employees AFNW <ul style="list-style-type: none"> ▶ Directed, as well as voluntary ▶ Incentivized (relocation bonus) <ul style="list-style-type: none"> ▪ Telecommuting via administrative tools or collaborate engineering environment to another Center without a relocation
Controls on external hires and internal actions to create placement opportunities	Strategic hiring, using appropriate incentives
Retraining for future programmatic requirements	Retraining in needed competencies
Career Transition Assistance to facilitate attrition/placements	Career transition assistance to facilitate attrition/placements
Seek legislation to provide new incentives to encourage voluntary attrition and transfers	Seek legislation to provide new flexibilities, authorities, and incentives to attract/retain a capable and diverse workforce
When work transfers to contractor, structure contracts to provide NASA employees with	Consider non–civil service alternatives to meet requirements



If need for positions/competencies <u>diminishes</u> in certain areas	If need for positions/competencies <u>increases</u> in specific areas
incentives to seek employment with contractor	
Intergovernmental Personnel Act assignments to meet critical short-term needs in lieu of civil service employment	Increase use of Intergovernmental Personnel Act assignments to meet critical needs
RIF—Necessary only if all other strategies and tools are inadequate to handle Agency unfunded FTEs	

6.7 REPORTS AND OUTPUTS

Figure 10 lists several typical Center reports that support OWFP. This is not a comprehensive list, but representations of reports that are commonly developed to anticipate center specific field and analysis.

Figure 10: Key Outputs to Center Human Capital Functions

Center Reporting Functions	Key Outputs
Staffing Phasing Plans	<ul style="list-style-type: none">Accounts for the projected losses in phases, hiring throughout fiscal year; determines when you bring hires in to match the cumulative burn rate to the Center ceiling
Producing Attrition Rate Reports	<ul style="list-style-type: none">Identifies losses by attrition and includes average age and grade level of General Schedule employees, sorted by various views including Center, GS level, etc. The attrition calculation is made by dividing the onboard headcount at beginning of fiscal year by the total number of persons separating during the fiscal year due to retirement, transfer, death, or other reasons.Identifies potential future attrition by projecting retirement rates. The average retirement rate is calculated by dividing the total headcount eligible to retire plus all those who became eligible to retire during that fiscal year by the total actual retirements, and spreading that percent over the planning horizon.
Developing and Maintaining Standard Data Sets	<ul style="list-style-type: none">Provides information to develop and maintain data sets used by workforce planners at the Center level to track and maintain workforce status at various points in time. The Agency has provided Center with several data sets such as WICN, the FPPS Datamarts and CMS to query and use workforce data. WICN Cubes also generate their own qualitative or quantitative reports, which can be used to track Center health metrics, workforce snapshots, and other workforce trends. Each Center is required to update the source systems for the WICN Data Cubes (WIMS, CMS).Uses the Human Capital Information Environment (HCIE) Workforce Services Portal to access information about the workforce through the Personnel Data Warehouse (PDW), which pulls data from FPPS, ALDS, WIMS, SATERN, and other systems into a single, centralized personnel database.



OHCM also produces the FAIR Act inventories, which allow NASA managers to identify these activities and consider the costs of performing these in-house versus contracting for needed services.¹⁷

6.8 POLICIES

OWFP policies provide guidance and guidelines on the managing of workforce mix, usage, appointment types, and competencies. At the Agency level, these policies include ceiling control, hiring restrictions, perm-term target ratio, and critical competencies identification (for application of NASA workforce flexibilities). At the Center level, these policies include the following:

- ▶ Determine how to establish hiring phasing targets (e.g., whether the Center will manage to an FTE target or to an onboard target)
- ▶ Create Center management processes (e.g., approval processes, Directorate ceilings) and operational workforce requirements based on resource constraints, analysis, and other activities and data
- ▶ Target perm-term ratios (e.g., to particular workforce types)
- ▶ Manage and size student pipeline.

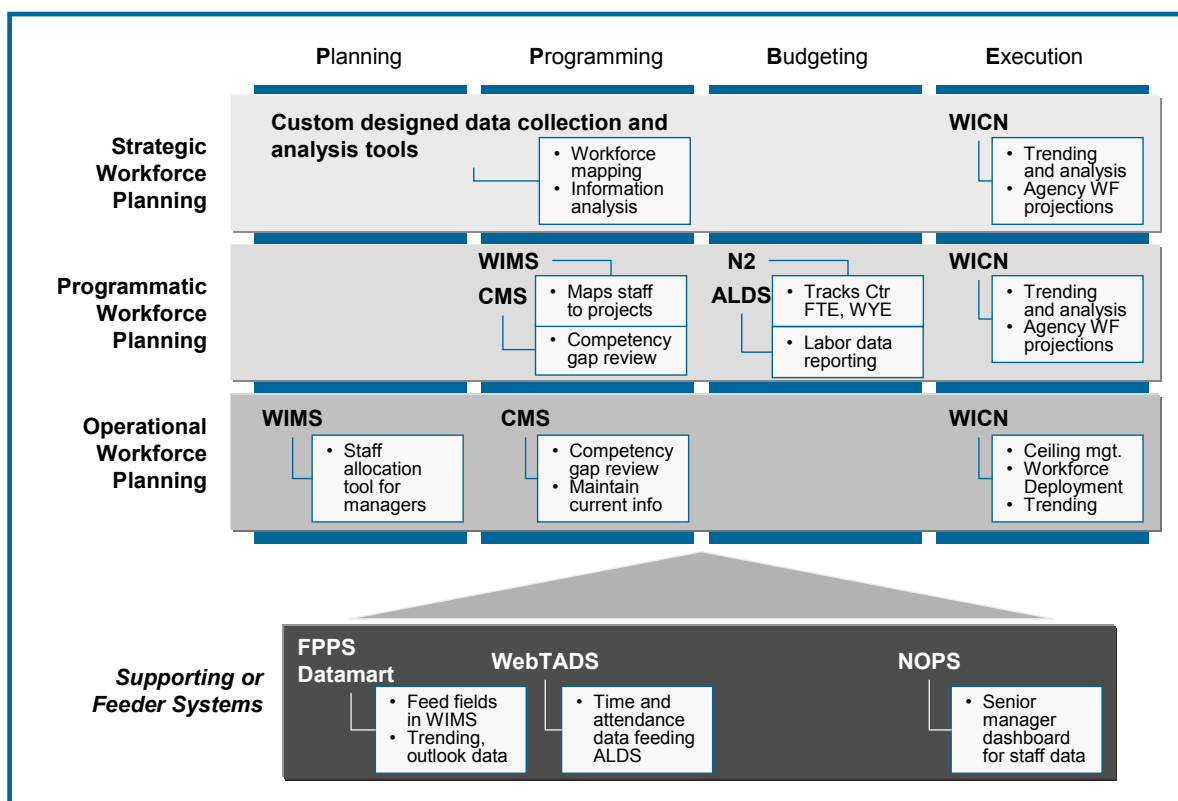
¹⁷ See Appendix G for more information about the FAIR Act.

7. Workforce Planning Systems, Data, and Reporting

7.1 INTRODUCTION

This section of the desk guide introduces the workforce planning systems, data sources, and report-generating resources that the Agency and Centers use to store, retrieve, and analyze data supporting workforce planning on an ongoing basis. Agency and Center workforce planners can access these systems at varying stages of the PPBE process either to facilitate future planning activities or to analyze workforce data. Figure 11 depicts these workforce planning systems, the data they provide, the relationships among these systems, and the PPBE phases and levels of workforce planning. Detailed descriptions of these analytic resources are available in the Data Dictionary of Workforce Planning Systems.

Figure 11: Systems and Data Resources Supporting Workforce Planning in PPBE Process



7.2 HUMAN CAPITAL INFORMATION ENVIRONMENT

The Human Capital Information Environment (HCIE) enables Agency-wide access to human capital information from a variety of NASA workforce management systems. HCIE includes the Workforce Services Portal and centralized data warehouse that when fully enabled, will connect OHCM, the Integrated Enterprise Management Program, and the NASA Shared Services Center

for near-real-time delivery of comprehensive, integrated workforce information from budget, finance, payroll, and security systems. This portal will enable communication and collaboration among a variety of programs and communities of practice, including employees, managers/supervisors, program/project managers, workforce planners, security, and human resource specialists. In addition, supervisors, managers, and project leaders will be able to use the HCIE as an authoritative data source for personnel and payroll information, awards, recruitment and hiring, performance, training, competency information, and workforce planning. HCIE also will consolidate current human capital applications, eliminate redundant systems, and integrate the remaining human capital processes and systems, ultimately increasing data reliability, eliminating repetitive data entry, and increasing automation and employee self-service.

— Links —

To access the Workforce Services Portal in HCIE, visit <https://hcie.nasa.gov>

7.3 WORKFORCE INFORMATION CUBES FOR NASA (WICN)

NASA tracks civil service personnel closely and provides updated information to Agency management every 2 weeks through an on-line analytical processing (OLAP) software called Cognos PowerPlay which provides business analysis and reporting solutions. The **Workforce Information Cubes for NASA (WICN)** were developed in Cognos PowerPlay to summarize workforce data in multidimensional views and combinations. The Cubes have two types of user access rights: 1) password-protected access for internal NASA users to detailed data; and, 2) no-password access for public users to standard data. These Cubes contain information on workforce strength, competencies, history, demographics, and dynamics extracted from various operational systems, especially from the personnel/payroll system and the labor distribution system.

— Links —

For more information about WF Cubes or how to use the system, click on the following links:

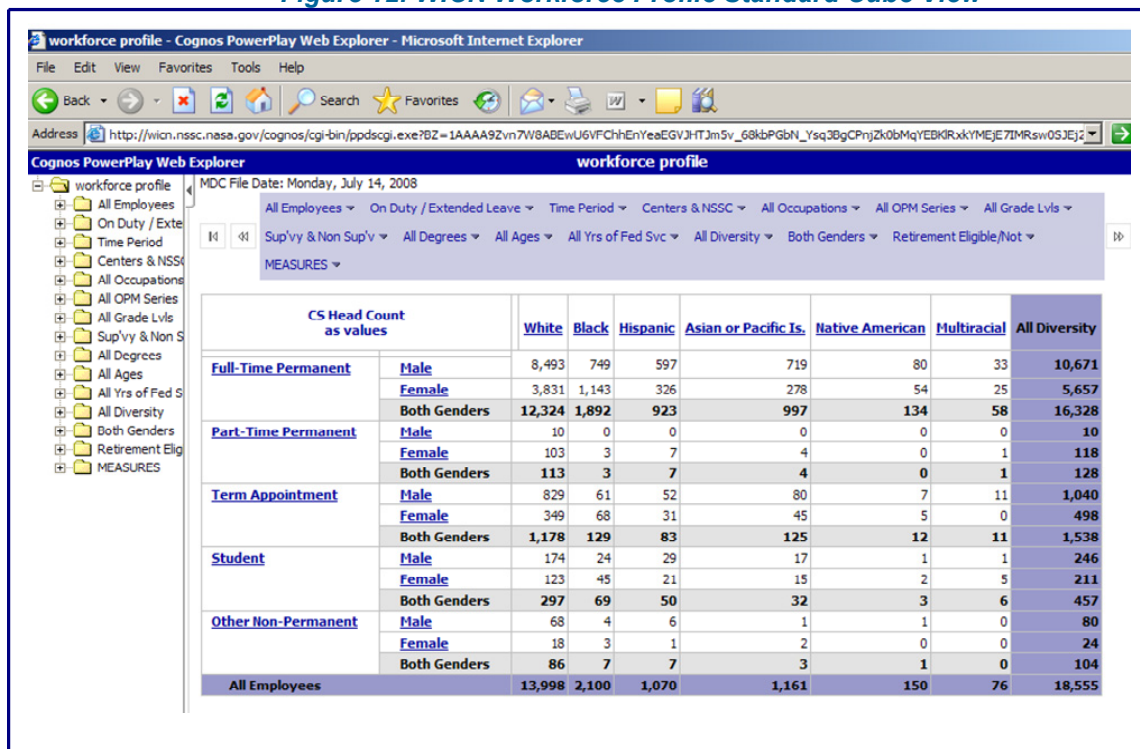
- ▶ <http://wicn.nssc.nasa.gov/> to access WICN
- ▶ <http://nasapeople.nasa.gov/Workforce/data/WICNCurrent.htm> for selected views of the current workforce profile

The Cubes provide the fundamental workforce data and data drill-down capabilities that are vital to Strategic, Programmatic, and Operational Workforce Planning. Agency and Center managers and planners all have access to current and historical workforce composition and demographic data available through the Cubes. They can use these data to conduct forecasts and trend analyses, evaluate workforce changes over time, and extract data points of interest for other reports. Although the Cubes themselves do not produce data reports, the data contained within the Cube views can be downloaded into MS Excel to create specific reports for analysis.

These Cubes are generated via the Workforce Information Management System upload files from various operational systems (e.g., FPPS and ALDS). Currently, there are six Cube Types and fourteen Cube Views available and published for internal and public users to view. The Cubes contain various dimensions of data, any of which can be dragged and dropped to replace the row or column to show multiple views by the user. They can also click on a row or column

label to drill down to a lower level of detail. Figure 12 is an example of a multi-view Cube display reflecting the head count for all employee types, by diversity, and by gender.

Figure 12: WICN Workforce Profile Standard Cube View

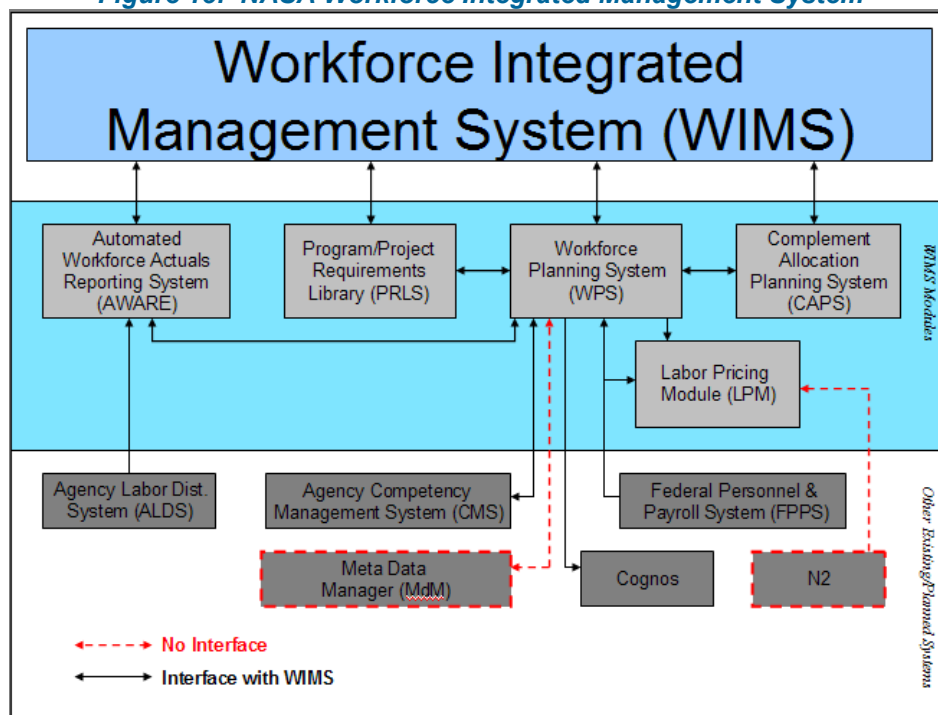


The NASA Shared Services Center (NSSC) hosts the Cubes to the public and internal NASA users in the Workforce Planning Community on behalf of the Office of Human Capital Management (OHCM). As the host, NSSC is responsible for software upgrades required to maintain the system for producing accessible data Cubes for all users.

7.4 WORKFORCE INTEGRATED MANAGEMENT SYSTEM

NASA's Workforce Integrated Management System (WIMS) is the Agency-wide application and data source for workforce planning that provides a single repository for the Centers and Agency to collect and manage the workforce data. Centers use WIMS to answer Agency Snapshot data calls during the PPBE planning process. WIMS is comprised of five modules that are grouped into two types of workforce planning modules for producing data for the PPBE planning phase: 1) Project/Program Requirements Library System (PRLS), Workforce Planning System (WPS), and Complement Allocation Program System (CAPS) modules used for planning workforce full-time equivalents (FTEs); and 2) Automated Workforce Actuals Reporting System (AWARE) and Labor Pricing Module (LPM) used for planning workforce monies and actual spending. Figure 13 depicts the relationships between WIMS and the related operational systems for workforce planning activities. The WIMS System Administration Team at Langley Research Center (LaRC) is responsible for the system's overall technical maintenance and making updates on behalf of the Agency.

Figure 13: NASA Workforce Integrated Management System



The Agency uses WIMS to allow Centers to manage available for new work (AFNW) FTEs and integrate core capability requirements into future workforce needs. The WPS module is the main component of WIMS and is a mandatory module that links to each WIMS module and interfaces with the different operational systems to identify FTEs, projects, and workforce competencies needed to develop strategies to meet Agency goals. The PRLS and CAPS modules are optional modules within WIMS for workforce demand and complement planning data respectively.

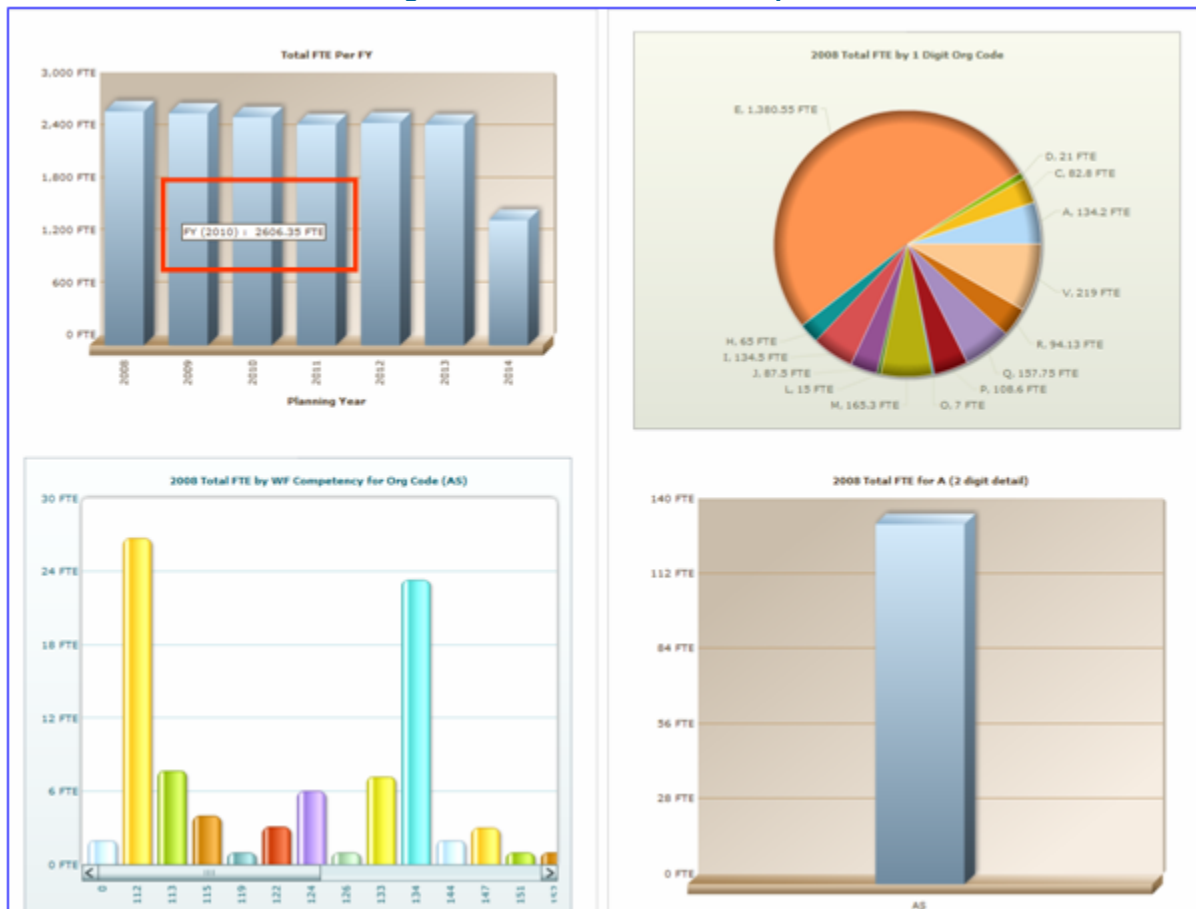
WIMS interaction with the operational systems allows recent data to be available to the Centers for workforce planning updates and data analysis. Figure 14 lists the primary functions of the operational systems that work with WIMS.

Figure 14: Functions of Operational Systems that Provide Data to WIMS

Operational System	Function
ALDS	Provide charged labor information
CMS	Provide information about employees' competencies
FPPS	Provide information on the NASA employees and organizations
MdM	Provide inventory of approved NASA projects
N2	Provide information on budget and demand data on a yearly basis
Cognos	Provide information on NASA's workforce demographics, competencies, history, and dynamics

Each WIMS module has standard reports as well as WIMS Graphical reports to support workforce planning analytic activities. The WIMS module standard reports primarily provides data comparison between modules (e.g., CAPS vs. WPS) for the Centers to review and analyze workforce supply and demand discrepancies. The Graphical Reports include the Dashboard and Adhoc reports. The Dashboard graphical reports can be viewed differently depending on the data point selected on one of the four charts as displayed in Figure 15. Each chart displays information for the particular data point selected when scrolled over it. Also, there is drill through capability to access additional data, by clicking on the graph data points. Finally, all charts are linked and the actions in one graph will be reflected in another graph.

Figure 15: WIMS Dashboard Reports

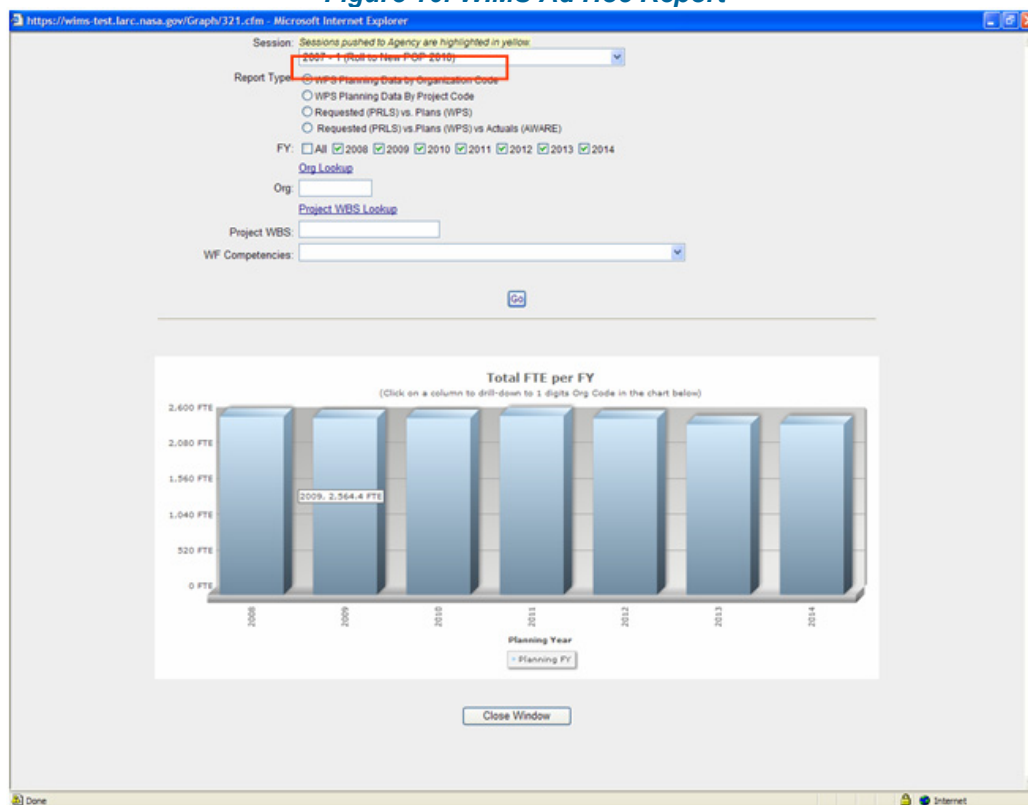


For the Ad Hoc report, there are selection criteria/options available to produce results in the bar chart. Unlike the Dashboard report with the criteria already built into the reported charts, the Ad Hoc report in Figure 16 provides the flexibility to generate the outcome results with similar functionality. The selection criteria includes:

- ▶ Session - The description of the period of time (typically including the date) and activity for the report

- ▶ Four Report Types: WPS Planning Data by Organization Code, WPS Planning Data by Project Code, Requested (PRLS) vs. Plans (WPS), Requested (PRLS) vs. Plans (WPS) vs. Actuals (AWARE)
- ▶ Fiscal Year (all years or combination of years)
- ▶ Org Code or Project WBS - Look-up by single code or the system defaults to a Center wide report
- ▶ WF Competency

Figure 16: WIMS Ad Hoc Report



A more detailed, descriptive explanation of the data elements for WIMS and its related operational systems is available in the **Data Dictionary of Workforce Planning Systems**.

7.4.1 Programs/Project Requirements Library Module (PRLS)

The PRLS module provides a centralized management of project requirements for current and projected civil service and contractor workforce demand for planning the workforce supply in WPS. It is a single location and universal format for capturing project-level technical, budget and schedule requirements, similar to a statement of work. PRLS is an optional selection within the WIMS main menu with three sub-menus that include: Program/Project Requirements Library (PRLS, a sub-menu option with the same name as the module itself), Manual PRLS and Old PRD Documents, and PRLS Reports. PRLS is the single location within WIMS and universal format for technical, budget, and schedule requirements for all work to be performed at the Centers.

The Centers have the option to use PRLS to establish the demand in WIMS by determining the project requirements. The LaRC WIMS System Administration Team uploads the WIMS project/WBS structure once a week with the MdM Programmatic Formulation NASA Structure Management (NSM) Report at the six digit project level for the PRLS and WPS modules. They also review the upload validation file for active and inactive projects to flag for the Centers. Each Center Administrator has access to use the WBS structure as a baseline to determine which projects are applicable to their Center, to create lower level project hierarchies, or to add active project codes for planning demand. Flagged inactive projects remain in WIMS to allow the budget execution data to be available for reporting actual spending in the ALDS and workforce planning reports.

In PRLS, the Centers have the opportunity to update all or part of the civil service and contractor workforce demand requirements when adding a Program/Project Requirements Document (PRD). The PRD document consists of seven sections: Main Information, Service Activities and Facilities, Key Deliverables and Milestones, External Agreements and Acquisition Strategies, Multi-year Plan (08-14), Sub-PRD, Full Cost Summary and Submit PRD, and Sub-PRD. By adjusting or adding PRDs the Centers initiate demand requirement discussions and negotiation opportunities between the Centers and Mission Directorates (MDs). Upon completion of the PRDs, Centers can generate and download standard reports into Excel from the PRLS Reports sub-menu option.

— Did You Know —

The NASA work breakdown structure (WBS) presents a hierarchy of major tasks supporting a project task, subdividing and organizing them into their corresponding subtasks. These tasks and subtasks may be used to outline a project schedule and assign responsibilities at a discrete level. For example, project subdivision must be sufficiently detailed to identify a given NASA project (1), supporting which Mission (2) and Theme(3), aligned to which Program (4), identified with which project (5) and which task, or pieces of work (6), using the required project codes.

7.4.2 Workforce Planning System Module (WPS)

The WPS module enables NASA to ensure that workforce is planned in detail (e.g., by name or by competency) at the project level for all years in the budget planning horizon. WPS is the main component of WIMS where workforce supply data is entered by the Centers to feed other modules for calculations and to develop comparisons between modules for workforce analysis. The WPS module consists of six sub-menus: Program Year (PY) Planning (08), Current Year (CY) Planning (09), Budget Year (BY) Planning (10), PY (08)/ CY (09) Planning, PPBE Planning (11 through 14), and WPS Reports.

As the primary WIMS module for workforce planning, WPS assists in aligning the appropriate workforce competencies against the technical requirements. Competencies are planned in WPS by assessing workforce supply characteristics such as the number, skills, availability, scalability, and flexibility of the current workforce.

The WPS module is linked to the demand workforce in PRLS and workforce competencies in Competency Management System (CMS). The WPS module and CMS are interfaced directly to pull the primary competencies into WIMS. It also receives daily personnel updates via the Federal Personnel and Payroll System (FPPS) Department of Interior (DOI) Datamart which includes changes in the NASA organizational structure and employee records. Centers perform workforce planning in detail at the organization, individual, competency, project, and FTE level

in the program and current years in WPS to produce the workforce supply results. For the out years, workforce is planned at the competency and FTE level. When the workforce supply to workforce demand is complete, the results serve several purposes:

- ▶ To identify skill and competency gaps and availability
- ▶ To identify potential Center competency over/under runs
- ▶ To manage workload staffing levels
- ▶ To assess the impact of cancelled programs and projects to planned workforce and competency mix
- ▶ To justify budget allocations so that organizations and projects meet their objectives

7.4.3 Complement Allocation Planning System Module (CAPS)

The CAPS module is elective module within WIMS that is used to set and maintain organizational FTE ceilings at the Center level and below (i.e., the number of FTE that is allocated to Center organizations). The complement ceiling is the number of full-time permanent (FTP), part-time permanent, and term slots that an organization is allocated. The CAPS module provides a means to set multi-year ceilings for each single and two-digit org code based on how the Center authority decides to bring in the complements. CAPS is comprised of four sub-menus: Maintain Org Complement, Update Org Code Description, Maintain Org Complement in WPS, and CAPS Reports.

The CAPS module offers the ability to change the organization's code description and add new complement org codes within the module because it does not receive the personnel updates for the organizational structure and employee records through FPPS.

The main value of CAPS is a comparison between FTP ceiling guidelines and actual FTP assignments (over or under runs) which can be viewed in the sub-menus "Maintain Org Complement in WPS" or "CAPS Reports". The "CAPS Reports" sub-menu reports the differences between the ceiling and the plan in WPS and are downloadable to Excel.

7.4.4 Labor Pricing Module (LPM)

The goal of LPM is to create a "single entry point for LBAs to obtain labor costs. This single automated solution will provide a uniform labor calculation solution available to other modules requiring labor data. LPM combines FPPS salary data with WPS FTE/WBS planning data to identify the cost to project civil servant labor and for pricing labor plans by program/project or by organization.

The LPM is the monetary component of WIMS capturing the labor cost associated with FTEs which was developed for NASA Labor Budget Analysts (LBAs). LPM is tightly coupled with the WPS, the workforce planning module within WIMS. LPM assists with:

- ▶ Identifying the Centers or the Agency labor costs for Program Year (PY), Current Year (CY) and Budget Year (BY),
- ▶ Identifying labor costs of a project or organization



- ▶ Identifying labor budgets for projects
- ▶ Documenting planned benefits/awards/bonuses and their impact on future budgets

An example of labor pricing would be for over four years, a given Center may need an increase of ten FTEs to support a particular program. In this case, WIMS allows managers to perform a cost build-up to project the cost of this FTE increase over time.

Center managers input employee data by tracking each piece of work undertaken on WBS codes for the present year (at the six-digit project level), then track how much time the employee will likely spend on this work over a given WYE. Managers undertake this level of planning for three subsequent years. To plan for the out-years, managers identify staff by the specific competency required for a piece of work over the next four years.

LPM is automating the labor pricing process across the Agency with the intent to minimize the use of numerous complex spreadsheets and provide a consistent calculation solution and process. In addition, one of the values of LPM is the ability to perform “what if” scenarios with the same assumptions, using the same dataset.

7.4.5 Automated Workforce Actuals Reporting System Module (AWARE)

The AWARE module is the link that integrates WIMS with the Agency Labor Distribution System (ALDS). It allows Agency managers to compare actual against planned employee utilization. In this way, the system can track the hours charged that employees have entered against each task, allowing managers to compare how many hours have been burned against the hours planned thus far and to project how many more hours are needed to complete each task. The AWARE reports direct labor hours using raw time and attendance data from ALDS. The AWARE’s main function is to:

- ▶ Provide details on Performing Organization, employee name/title, workforce competency, WBS Code, and labor charges in a single report
- ▶ Provide project managers with information about who has charged against their project WBS and compares those charges to what was planned in the WPS module

7.5 COMPETENCY MANAGEMENT SYSTEM (CMS)

The Competency Management System is an Agency-wide system that represents the Agency’s corporate knowledge base and helps management identify current and future competency needs based on a compilation of Program and project needs. CMS provides the capability for Centers to plan employee development, hiring, or resource reallocation to bridge skills gaps. Using CMS, managers can identify positions and their associated competencies, search for competencies to support their projects, and track the current competency levels of their workforce.

CMS’s *Workforce Competency Dictionary* represents the diversity of the NASA civil service workforce capabilities. The *Workforce Competency Dictionary* is a compilation of all competencies required across NASA, organized into knowledge domains and subdivided into the following simple hierarchy:

- ▶ Knowledge Domain

- ▶ Competency Sub-Group
- ▶ Competency
- ▶ Sub-Competency.

The dictionary is designed to capture the full breadth of NASA's corporate knowledge as it applies to the Agency's strategies and goals.

CMS maintains both the competencies that are required for each position (regardless of the incumbent) and the employee competency portfolios that can be analyzed in relation to jobs. To ensure that CMS contains the most current competency information to support decision-making processes, Centers update their CMS position competencies annually before developing the annual budget plan. Center managers are required to build competency portfolios for positions within their organizations, designating to those competencies (with particular attention given to the designation of a primary competency for each) required to carry out the functions of that position, regardless of the incumbent.

An automated, nightly system interface process to transfer civil service employee competency data from CMS to WIMS (WPS module) ensures employee competency data is current in WIMS. The interface process is completed via an Extensible Markup Language (XML) pull for datasets based on tags. The CMS to WIMS interface includes two datasets: 1) Dataset 20, the Workforce Competency Definition (CMS Workforce Competency Dictionary data elements); and 2) Dataset 2, the Position Workforce Competency (competencies per position). Another dataset -- Dataset 1, Employee Workforce Competency -- is a list of competencies per employee which includes data elements: UUPIC, CompID, EmpProficiencyLevel, ValidationMethod, and ValidationDate. Dataset 1 is used only for CMS purposes to generate reports. It is also used for locating expertise, presenting information to functional offices, identifying employee development, and assisting in succession planning. The Center administrators of WIMS have access to set the Center Profile for CMS nightly updates. The Centers use the current competency information in WIMS to assign individual employee level of effort to specific projects or tasks.

Data is also transferred from WIMS to CMS in a manual upload process via a flat file of the Dataset 5 of competencies, by organization, by program/project, and by fiscal year. Dataset 5 is a list of competencies and FTE required per project, per scenario. At the Agency level, CMS connects these processes by identifying specific employee competencies in WIMS. Because competencies are associated with employees, job positions, and workforce requirements for NASA programs and projects, CMS enables the Agency to perform a detailed analysis of the gaps between current workforce capability and forecast demand.

Figure 17 summarizes what CMS does and does not support:

— Reference —

The rating scale in CMS contains four tiers, from Basic Knowledge (Tier 1) to Subject Matter Expert (Tier 4). For further information about the competency rating system and how to determine tier level, refer to the *Workforce Competency Dictionary*, at http://ohcm.gsfc.nasa.gov/cms/CMS-DOC-01_Rev6a_NASA_CompetencyDictionary.doc

Figure 17: Key CMS Support Functions

CMS Supports	CMS Does Not Support
<ul style="list-style-type: none"> ▶ Human Capital Management—Facilitates identification of critical competencies ▶ Employee Development—Associates training with competencies ▶ Expertise Locator—Eases the internal search for expertise and knowledge ▶ Knowledge Management—Creates valuable communities of practice ▶ Communication—Provides consistent language and framework for Agency reporting 	<ul style="list-style-type: none"> ▶ Job Selection—Not designed or used as an Agency selection system ▶ Pay Setting—Not designed for job analyses and classification ▶ Performance Evaluation—Not designed for employee evaluations ▶ Task/Work Assignments—Not designed to provide a supervisor with all task- or job-specific information

7.6 AGENCY LABOR DISTRIBUTION SYSTEM

Agency Labor Distribution System (ALDS) is the centralized labor data and reporting system for all Centers. This system ensures improved consistency and integrity of the data in support of full-cost accounting and management decision-making. ALDS captures labor cost data at the employee level, posts labor cost, hours, and FTE; and, standardizes FTE calculation. OHCM uses ALDS to build the Distribution Cube (in WICN) using actual FTE burn rates for projects, programs, and MDs.

ALDS pulls the data from WebTADS – NASA’s Web-based time and attendance system within which NASA employees record worked hours against projects, manage overtime hours, and process leave requests.

7.7 N2

N2 is the official budget system of record for the Agency. As it is also the official source of all demand data, N2 generated reports feed a variety of systems and analyses and receives input from those same systems.

From a workforce perspective, the workforce demand data in N2 reflects the FTEs and budget dollars for the Agency project requirement needs. The Centers and MDs use N2 to track FTEs, contractor WYE, labor, travel, and procurement monies for workforce purposes on an annual basis. This N2 data is subdivided by MD, then by theme, program and project level for planning. To provide other aspects of the N2 data, two new fields, “Center Budget” and “Other Center Budget” were added to accommodate situations when a Center has the contract WYE budget funding but they are at another Center to perform the work. The “Center Budget” field represents the actual Center budget dollars and the “Other Center Budget” is for when another Center has the budget dollars.

The workforce and resource requested data contained within N2 is critical to the PPBE process and is central for validating workforce data in other systems throughout the year. N2 information facilitates negotiation between a Center and the Agency and quantifies the workforce decisions



that Centers and MDs make. More important, the data contained in N2 are the basis for reports that form the OMB budget submission.

N2 data is populated iteratively over the course of the annual PPBE programming and budget activities. At different times, different groups (e.g., MDs, CAMs, Centers, CFO) are active in the system; while each is active, other groups are not allowed to update the system. At the beginning of the N2 update process, MDs enter what they believe their workforce demand will be by project. This data evolves based on such things as: negotiation with Centers regarding how much workforce supply can be assigned to support a project, decisions made in the Strategic Acquisition Process, distribution of work packages, etc. Nearing the completion of budget planning activities and the IIA, Centers input workforce data into N2 and submit these to MDs. During the months that follow, the dialogue between Centers and MDs continues, which may bring about changes to the final FTE and/or the dollar allocations that Centers enter into the system. After Centers and MDs agree on the funding and FTE resources required for project activities, Centers are “frozen out” of the N2 system and the information passes to MDs. After MDs make the final changes, the OCFO then uses these data as the basis for the OMB budget and report.

Data in N2 are also used as a baseline for WIMS. Currently, Centers manually update the FTE demand by project and organization in WIMS PRLS module referencing the N2 data for workforce planning. They also complete the ceiling FTEs in the WIMS CAPS module which is driven by the demand data.

7.8 MdM

The Meta Data Manager (MdM) is a web-based application that contains the official NASA Structure Management (NSM) data elements and associated codes, and aligns the Agency’s technical work breakdown structure (WBS) with the financial coding structure. NSM is a single, integrated programmatic and institutional data management structure that supports the financial cycle from budget formulation through budget execution. The NSM hierarchies are:

- ▶ Programmatic Hierarchy – Representing projects managed by the Mission Directorates
- ▶ Institutional Hierarchy – Representing projects under Working Capital, Institutional Investments, Service Pools, and Corporate Management and Operations (CM&O)

MdM is located on the Integrated Enterprise Management Program’s (IEMP) portal and interface with the budget formulation system (N2), core financial system (SAP), and project management system to feed the NSM codes that require coding structure data. MdM identifies, creates, tracks, organizes, and archives Appropriation, Mission, Theme, Program, Project, and WBS 2 through WBS 7 structural elements.

To update WIMS with the latest NSM WBS, LaRC manually downloads the standard Programmatic Formulation NSM Report with the appropriate year in Excel format once a week to import into WIMS (for the PRLS and WPS modules) that same day. Through this import process, WIMS creates the capability for Centers to plan FTE against the NSM WBS for the current year (CY), execution year (EY, CY+1), and PPBE years at the project level.



7.9 FEDERAL PERSONNEL AND PAYROLL SYSTEM DATAMART (SUPPORT & FEEDER SYSTEM)

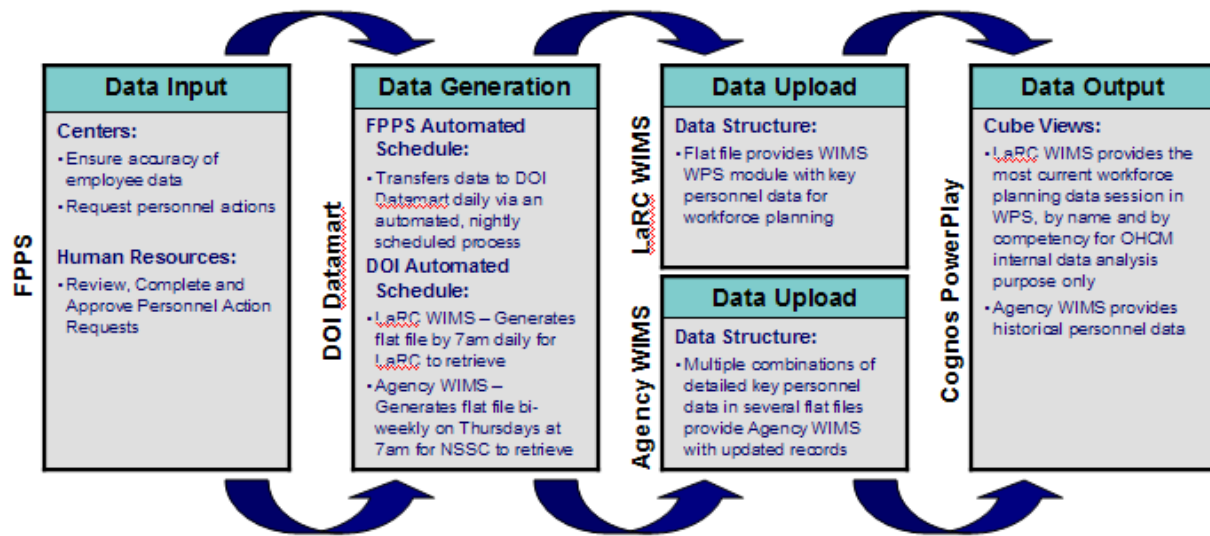
FPPS is an online personnel and payroll system used by a number of federal agencies. FPPS complies with system requirements and specifications outlined by the Paperwork Reduction Act, the President's Council on Management Improvement for Federal Automated systems, Government Accounting Office (GAO), Office of Management and Budget (OMB), and the Financial Systems Integration Office (FSIO).

Each Center is responsible for ensuring that the FPPS data on their employees are correct. Managers across Centers submit requests for personnel actions (e.g., promotions, transfers, pay adjustments) through FPPS. Human resource specialists then review, complete, and approve the actions based on applicable federal laws and regulations. Thus, FPPS is the primary source of information on NASA's civil service workforce, which feeds many other automated NASA systems. FPPS feeds workforce planning related data to both the Workforce **Integrated** Management System and Workforce **Information** Management System. The Workforce Integrated Management System is the WIMS tool used to plan the demand, ceiling, supply, labor costs, etc. The Workforce Information Management System is a data repository of historical personnel information used to update the Cognos WICN Cubes for reporting data point results.

FPPS feeds data to both systems daily via an automated, nightly scheduled process through the Department of Interior (DOI) Datamart. The DOI Datamart generates a flat file to the LaRC mainframe LPAR by 7am each morning for LaRC to retrieve and upload into WIMS. The personnel actions processed through FPPS feed personnel data fields in WIMS for status snapshots as of the end of every pay period.

The DOI Datamart also generates another flat file on a bi-weekly basis (each Thursday at 7am) for the Agency Workforce Information Management System and places it on the SFTP Server Transmission for NSSC to retrieve and upload for the WICN Cubes. The WICN Cubes make reporting easy for users and produce output useful for workforce analysis. Essentially the FPPS Datamart provides current and historical information on the workforce to assess historical trends for use as a basis for forecasting retirement eligibility, employee accession and attrition, supervisory ratios, and "fresh-out" hiring. Figure 18 illustrates an overview of the FPPS and WIMS interface process that includes data input, generation, upload and output.

Figure 18: FPPS and WIMS Systems Interface



7.10 NASA ORGANIZATIONAL PROFILE SYSTEM

The NASA Organizational Profile System (NOPS) provides Agency managers and supervisors with information about NASA employees, as well as with the ability to compare NASA organizations. NOPS is a web-based dashboard of more than 100 data fields on the current and past workforce; it produces concise weekly reports on the diversity mix of an organization, employee retirement eligibility, total organizational salary costs, and organizational expenditure on awards.

7.11 SPECIAL DATA COLLECTION AND ANALYSIS TOOLS

Agency managers, planners, and task teams are often called on to engage in strategic-level workforce planning, for which customized or specialized tools are developed as needed. Examples of these tools include the following:

- ▶ **Strategic Workforce Management Model**—SWMM serves as a workforce demand modeling and decision-support application that allows managers to frame demand against a time frame out to 2020. SWMM allows managers to consider the size of the Agency civil service workforce and to examine a number of workforce scenarios and their corresponding sourcing requirements.
- ▶ **Shuttle Mapping Worksheets**—These worksheets facilitate the modeling and migration associated with subsets of workforce demand and supply connected to the transition from the Shuttle to the new launch and exploration technologies. These worksheets address a variety of workforce alignment issues using both quantitative and qualitative techniques.

Customized tools are designed and developed to meet specific needs in support of the PPBE planning and programming processes. If the tools developed prove useful and have potential for other applications, the return on these creative investments can be considerable.



8. Summary

The purpose of workforce planning in NASA is to assess the demand for and supply of the workforce based on current and projected requirements, for the purpose of ensuring mission success. Workforce planning in NASA is different from traditional workforce planning due to its unique planning requirements and the complexities of the work and workforce within the Agency. One goal of workforce planning in NASA is to ensure a balance between supply and demand. In the Agency, demand is not fixed – it is constantly evolving. Demand can also be adjusted/changed – thus, both demand and supply are analyzed and adjusted to determine what can be done to bring them into balance. Another goal of WFP in NASA is to sustain critical capabilities – thinking not only about needs in the short term (e.g., what staff do I need for this project), but capabilities that are needed longer term (e.g., systems engineering) to ensure workforce decisions made now don't hurt the Centers or Agency later.

NASA has developed a workforce planning framework that includes three levels: strategic, programmatic, and operational. This is due to the complexity of WFP in NASA, based on the need for both short-term and long-term workforce planning, the participation of multiple roles - each with different needs and perspectives (e.g., Centers, Mission Directorates/Programs, Agency), and a necessary mix of qualitative and quantitative analysis.

The focus of strategic workforce planning is on the longer-term health of the Agency and Centers – including the composition of work and size/mix of the workforce. Strategic workforce planning is not grounded in “specifics” or details, rather planning around larger issues such as Center roles and the size of a Center. Strategic workforce planning goes beyond the budget horizon to assess how the Agency and Centers can set themselves up for success, ensuring NASA is building the right in-house skills, maintaining critical capabilities, and maintaining Centers of the right size. The next level of workforce planning, Programmatic, is tied to the PPBE process and drills down into the specifics of “how” to solve identified workforce misalignments (i.e., gaps/surpluses) within budget and ceiling constraints. Lastly, Operational workforce planning is focused on concrete actions to implement the decisions made in Programmatic workforce planning to deploy the workforce to perform the work of the organization. This includes using human capital actions (e.g., sourcing, recruiting, training) to address identified misalignments.

The outputs of workforce planning include strategic plans, workforce snapshots tied to the PPBE, hiring plans, and workforce reports. These outputs of workforce planning help NASA to identify the capability and capacity to perform the work of the Agency in the short and long term, identify areas of risk for workforce misalignments (gaps, surpluses), and outline management actions necessary to address misalignments. Workforce planning is, and will continue to be, an important part of NASA planning to better understand how well the workforce and work are aligned to accomplish the mission and strategic goals of the Agency.

Appendices

Appendix A—OPM Workforce Planning Model

The U.S. Office of Personnel Management (OPM) has developed a five-step model for federal agencies to fulfill basic workforce planning responsibilities on an annual basis (see Figure A-1).

Step 1: Set Strategic Direction—

Involves linking the workforce planning process with the Agency's strategic plan, annual performance/business plan, and work activities required to carry out the goals and objectives of the strategic plan (long-term) and performance plan (short-term).

Step 2: Analyze Workforce, Identify Skill Gaps, and Conduct Workforce Analysis—

Involves the following:

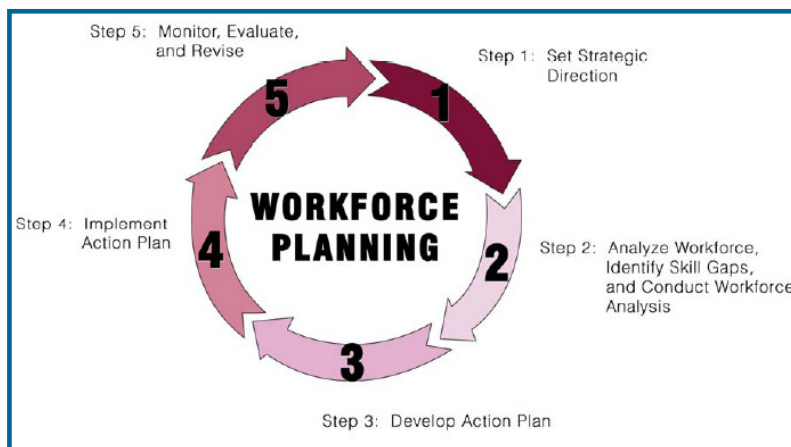
- ▶ Determine what the current workforce resources are, how they will evolve over time through turnover, and so on
- ▶ Develop specifications for the kinds, numbers, and location of workers and managers needed to accomplish the Agency's strategic requirements
- ▶ Determine what gaps exist between the current and projected workforce needs.

Step 3: Develop Action Plan—Involves identifying and developing strategies to close gaps, plans to implement the strategies, and measures to assess strategic progress. Such strategies could include recruiting, training/retraining, restructuring organizations, contracting out, succession planning, technological enhancements, and other activities.

Step 4: Implement Action Plan—Involves ensuring human and fiscal resources are in place, roles are understood, and the necessary communication, marketing, and coordination are occurring to execute the plan and achieve the strategic objectives.

Step 5: Monitor, Evaluate, and Revise—Involves monitoring progress against milestones, assessing for continuous improvement purposes, and adjusting the plan to make course corrections and to address new workforce issues.

Figure A-1: OPM Workforce Planning Model





Appendix B—Related Planning Activities

Workforce planning intersects many other Agency planning activities. Many functions that are critical to NASA's workforce management capabilities are managed centrally, but are not formally part of workforce planning at NASA. The following presents several of these planning functions and explains how each is independent of, but related to, workforce planning activities.

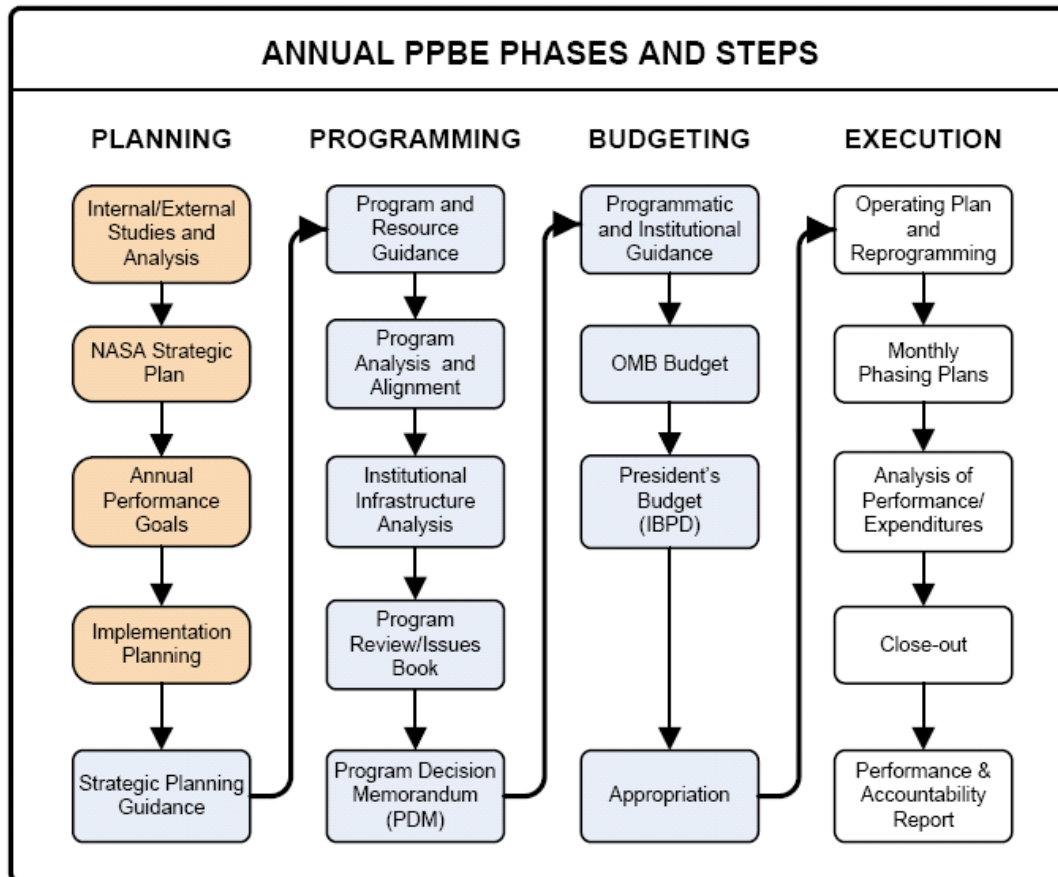
Planning Functions Related to Workforce Planning		
HR Function	Definition	Intersection with Workforce Planning
Position Management	Systematic approach that converts the organization's mission into major tasks, organizational elements, subtasks and sub-elements, and the duties of individual positions to achieve a balance between mission needs, budgets, and employee incentives. Position management serves to restructure existing positions or to create new positions based on the assignment of new functions to an individual position or to the unit as a whole.	Human resources staff who work with position management focus on classification and preparation of position descriptions, but the ceilings, mission planning, and workforce needs assessments that are part of the workforce planning process help to inform the functional requirements for which position management is undertaken at NASA.
Recruitment	Process of finding external candidates to meet current and future mission needs. Recruiting considers three time horizons—(1) immediate workforce needs given the expected work over the upcoming year; (2) upcoming one- to five-year work requirements with focus on the talent pipeline; and (3) long-term workforce requirements, focusing on education needs of the future NASA workforce—and works to influence this pipeline.	NASA recruiting efforts are driven by understanding the gap between current and future workforce requirements and current and future workforce supply; that is, what skills are needed and what skills must be recruited going forward. Workforce planning processes inform this gap assessment at a macro-level, while human resource planners at the Center level must continue to make micro-level mission-support decisions that are also constrained by FTE ceilings and budgets.
Retention and Separation	Management of incentives and programs providing valued NASA employees with opportunity to develop and advance their careers with the organization in meaningful ways, as well as separating from the organization when and if necessary. Human resources professionals also manage Voluntary Separation Incentive Programs (VSIP) and Voluntary Early Retirement Authority (VERA) during the designated window periods.	Workforce planning processes serve to identify the capabilities in highest demand as well as those that present diminishing value to the organization. Such data provide a basis for retention and separation actions for human resources professionals.



Planning Functions Related to Workforce Planning		
HR Function	Definition	Intersection with Workforce Planning
Succession Planning	Centers create development programs to build talent in pipeline areas. Centers provide career models for certain positions, which help individuals better understand the skills and experience they will need to advance.	Succession planning efforts vary across Centers, but workforce planning analyses provide Centers with the information about critical skill requirements and mission planning that they need to undertake succession planning in various forms.
Strategic Acquisition	Strategic acquisition process is undertaken to determine the distribution of work between civil servants, support services contractors, and prime contractors in accordance with the <i>Strategic Planning Guidance</i> . The acquisition process strives to ensure that MDs and key sponsors of institutional buys vet strategic decisions against Agency priorities overall when evaluating upcoming procurements.	Focuses on workforce planning concerns, such as make/buy decisions considered in the course of planning and supporting the FAIR Act, as well as planning concerning the need to cover staff who are available for new work (AFNW). Outputs of the workforce planning process drive workforce mix considerations as well as the number of AFNW, when AFNW employees are “covered by work that might have been contracted out.”

Appendix C—Annual PPBE Phases and Steps

Figure C-1: Annual PPBE Phases and Steps



1. Planning Phase

The Planning Phase determines the priorities for the Agency and is set forth in the *Strategic Planning Guidance* document (SPG). The SPG provides all of the relevant strategic guidance for developing a programmatic and financial proposal for the Budget Year plus four out-years (e.g., FY08 through FY12). This includes high-level resource control totals and total direct full-time equivalent (FTE) by Center, which are consolidated into the SPG.

2. Programming Phase

The Programming Phase encompasses the definition and analysis of programs and projects, together with their multiyear resource implications.

During the Institutional Infrastructure and Analyses (IAA), Centers and Mission Support Offices (MSO) identify what can be accomplished and the support that can be provided to the technical and institutional programs/projects within the funding levels received based on their evaluation of the Program Analysis and Alignment (PAA) report funding and FTE changes. Centers and



MSOs also identify any surplus or deficit capabilities and capacities, and identify the potential impact of funding reductions and/ or any need for funding increases. The focus of this step is on FTE levels/workforce, service pool availability, procurement capability, and other institutional issues.

The Program Decision Memorandum is the final step in the Programming Phase and includes adjusted control totals for dollar amounts and identifies control totals for FTE.

3. Budgeting Phase

The Budgeting Phase includes formulation and justification of the budget to OMB and Congress. During this phase, the OMB budget, the President's budget, and appropriations are refined and prepared. Within the Agency, the main step in the Budgeting Phase is to create the programmatic and institutional guidance that will feed into the information provided to OMB and will ultimately lead to FTE ceiling decisions during the passback.

4. Execution Phase

The Execution Phase is the process by which financial resources are made available to Agency components and managed to achieve the purposes and objectives for which the budget was approved. Policy for the Execution Phase is provided in Financial Management Regulation (FMR) Volume 5, Budget Execution.

Each phase of the PPBE process is critical to resource management, planning, and cost allocation functions. Human capital management concerns are central to this process and an understanding of the requirements of the PPBE process will help planners make better and timely decisions about their available resources as well as their financial constraints.



Appendix D—Workforce Planning Governance

There are three councils that serve as the primary internal decision-making and oversight bodies governing the work of the Agency: Strategic Management Council (SMC), Program Management Council (PMC), and Operations Management Council (OMC).

Council	Purpose
Strategic Management Council (SMC)	The SMC serves as the Agency's senior decision-making body for strategic direction and planning. The SMC determines NASA strategic direction and assesses Agency progress at the mission level.
Program Management Council (PMC)	The PMC serves as the Agency's senior decision-making body for baselining and assessing program/project performance and ensuring successful achievement of NASA strategic goals and objectives.
Operations Management Council (OMC)	The OMC serves as NASA's senior decision-making body for institutional plans and implementation strategies. The OMC determines and assesses mission support requirements to enable successful accomplishment of the Agency's new exploration projects and mission.
Responsibilities Specific to Workforce Planning	
Each Council to some extent— <ul style="list-style-type: none">▶ Serves as senior leadership forum for making decisions on institutional issues▶ Approves major new mission support initiatives, plans, and requirements▶ Oversees and approves institutional risk plans and mitigation strategies▶ Reviews progress on institutional initiatives, plans, and programs▶ Establishes institutional priorities and approves guidance for the formulation of corporate and institutional budgets▶ Oversees Agency internal control, identifies deficiencies, reviews corrective action plans, and evaluates progress against the plans▶ Provides prior review and concurrence on selected institutional issues with strategic implications before going forward to the SMC to be briefed or for approval▶ Identifies and reviews the status of Agency material weaknesses▶ Ensures that NASA is meeting the commitments specified in the relevant management documents and agreements for program/project performance and mission assurance	

In addition to the SMC, PMC, and OMC, an Agency-wide Workforce Planning Governance Structure was established in January 2007 to lead the effort to strengthen the Agency's workforce planning capability. Consistent with the goals and objectives of the Mission Support Plan, over the next few years, the Governance Group will focus energy and attention on the following:

- ▶ Increasing the level of integration and collaboration across workforce planning functions
- ▶ Improving the quality of information used to make decisions
- ▶ Balancing short- and long-term planning needs.

The three main components of the governance structure, as depicted in the figure below, include (1) Agency Governance Group, (2) Workforce Planning Technical Team, and (3) other technical teams as needed.

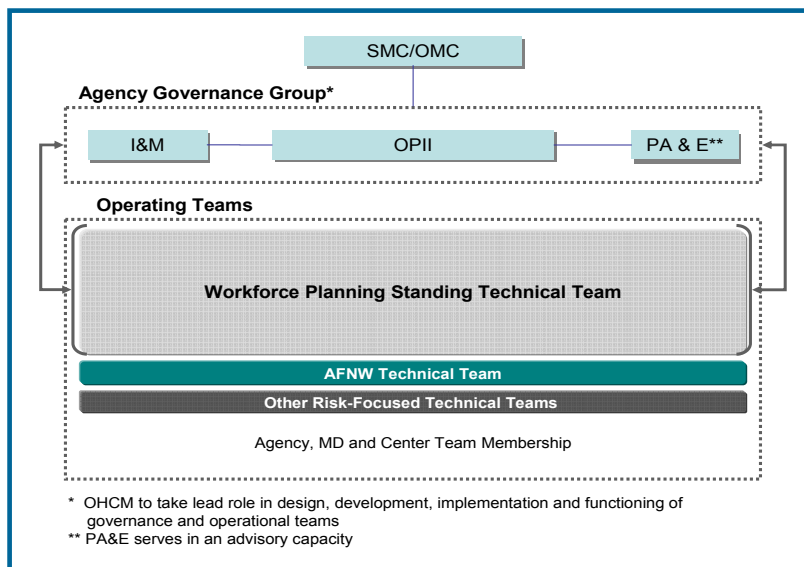
1. Agency Governance Group. The Agency Governance Group (with HQ representation from institutions and management, the Office of Program and Institutional Integration, and Program Analysis and Evaluation) evaluates proposed solutions to workforce issues and misalignments based on information and recommendations from Centers and the supporting technical teams that are part of the Governance Structure. This group surfaces recommendations to appropriate decision-making bodies, such as the SMC or OMC.

2. Workforce Planning Technical Team. A “standing” Workforce Planning Technical Team with representatives from the Centers, MDs, Safety & Mission Assurance, Office of the Chief Engineer, and elements of the Governance Group

constitutes a permanent working team that supports the Governance Group. Center human capital directors are members of this team as well. The team’s primary responsibilities are to design and develop workforce planning guidance and policies, to synthesize Center analyses of workforce capability to identify workforce risks that require Agency-level attention, and to develop recommendations for solutions. In addition, the team integrates efforts of existing ad hoc teams to ensure that a Center’s workforce planning contributions are well coordinated.

3. Technical Teams. The issue-based, ad hoc technical teams will be established to focus on specific issues of such criticality that dedicated effort is needed until the issues are resolved. An example is the Available for New Work (AFNW) Team (the follow-on to the Uncovered Capacity Review Team) convened to address potential utilization issues in FY09. Technical team implementation of workforce planning guidance and policies help develop and implement Center workforce planning capabilities and champion collection of sound data in support of the PPBE and other Agency-wide workforce activities undertaken by the team. The teams are hubs for workforce planning information collection, distribution, and reporting across NASA, and consist of Center administrators, managers, and senior human capital professionals as well as representatives from MDs.

Figure D-1: Components of Governance Structure





Appendix E—Detailed Roles and Responsibilities

Centers

Centers play a vital role in workforce planning, which includes planning for their future workforce needs, establishing base civil service intake and development efforts, and making workforce component balance decisions on strategic workforce requirements. Centers manage available for new work (AFNW) employees and integrate core capability requirements into future workforce needs. Concerning workforce planning, Centers are the units most familiar with the “on-the-ground” workforce needs, issues, and decision-making. NASA Centers are shown below.

Centers
<ul style="list-style-type: none">▶ Ames Research Center▶ Dryden Flight Research Center▶ Glenn Research Center at Lewis Field▶ Goddard Space Flight Center▶ NASA Headquarters▶ Johnson Space Center▶ Kennedy Space Center▶ Langley Research Center▶ Marshall Space Flight Center▶ Stennis Space Center
Center Responsibilities Specific to Workforce Planning
<ul style="list-style-type: none">▶ Provide current information to Agency/MDs/Programs about the health of Center capabilities (both those “assigned” to Centers by the Agency/MDs/Programs and others) to clarify what work they would benefit from being assigned, they could perform, or they need to keep their capabilities healthy (thereby making a clear connection between capabilities and work).▶ Given inputs, define the work with which their capabilities align (i.e., all of the work a Center could potentially be assigned or win over a planning horizon) and identify the most viable sets of work (which will be a range of work) based on interactions with Agency/MDs/Programs.▶ Conduct a comprehensive set of workforce planning analyses.▶ Define a strategy for the use of internal versus external workforce roles and optimal internal workforce (i.e., size, composition, structure), identify a set of management actions needed to mitigate the risk of long-term misalignments, shape supply against strategy, resolve or avoid misalignments, ensure the health of capabilities with regard to the strategic workforce plan, and identify relevant actions to be taken in next 1–2 years.▶ Surface to the Agency/Programs current or anticipated misalignments that cannot be resolved within the Center or solutions that require Agency approval, assistance, or attention (e.g., need more work, more funding, or approval for reduction in force).▶ Provide feedback on policies and practices/reality check, and on unintended consequences of existing Agency policies.

Office of Human Capital Management

In close collaboration with Center-level administrators and planners, the NASA Office of Human Capital Management (OHCM) provides day-to-day support to Centers and to MDs about process

phases, metrics tracking, Center-level planning practices and methods (realized or proposed), and workforce data and information management.

Office	Mission
Office of Human Capital Management (OHCM)	This Headquarters Functional Office is responsible for developing and aligning NASA workforce strategies, programs, policies, and processes with the Agency's mission, strategic goals, and desired performance outcomes. OHCM establishes Agency-wide workforce management policies; defines strategies and architectures; defines program objectives and top-level requirements; ensures statutory and regulatory compliance; ensures consistency across the Agency, as appropriate; and monitors program performance. OHCM represents the Agency's interests in intergovernmental and other groups established to address workforce issues.
OHCM Responsibilities Specific to Workforce Planning	
<ul style="list-style-type: none"> ▶ Conduct analyses on workload and workforce data at the Center level, aiding in Center-level decision support concerning options for mitigating risk or managing change when necessary. ▶ Ensure Centers are able to conduct full range of workforce planning analyses. ▶ Collaborate with Agency Governance Group to establish infrastructure for problem-solving and decision-making, particularly between Programs and Centers. ▶ Conduct periodic risk assessments based on Center reports and analyses. ▶ Set and communicate workforce policies or guidance that must come from the Agency; adapt policies and guidance based on feedback. ▶ Provide approval for actions recommended by Centers as part of the yearly planning and reporting cycle that are of consequence at the Agency level (e.g., reductions in force). 	

In addition to internal support tasks, OHCM also responds to workforce information requests that come to the Agency throughout the year from Congress, Government Accountability Office (GAO), Office of Personnel Management (OPM), and other external bodies. Examples of inquiries from oversight bodies to which NASA is responsible include the following:

- ▶ What are NASA's critical competency needs for the future? (GAO)
- ▶ What is NASA doing about competencies identified as associated with return to flight (RTF) to ensure they are available? (Inspector General [IG])
- ▶ What will NASA do to retain core competencies in a particular area at any given Center during periods when there is insufficient project funding to cover the workforce and facility costs? (Congress)
- ▶ What are the skills imbalances, by occupation and location? (National Academy of Public Administration? [NAPA])
- ▶ What evidence does NASA have that buyouts will produce the desired effect of transforming the workforce? (Congress)
- ▶ How many NASA civil service positions were eliminated as a result of transferring functions to contractors? (Congress)

NASA's credibility as an agency relies on its ability to answer these workforce-related questions coherently, succinctly, and with verifiable supporting data. In addition, in the case of congressional requests, NASA's capacity to answer these questions adequately demonstrates



NASA's ability to manage its workforce, and therefore has significant implications for appropriations. To that end, OHCM also works with Centers to improve the Agency's workforce data transfer capabilities, which also improves NASA's responsiveness to external data requests.

Office of the Chief Financial Officer (OCFO)

The Office of the Chief Financial Officer (OCFO) has primary responsibility for the budgeting and execution phases of the PPBE process. At the agency level this includes preparing budgeting and forecasting requirements, making tradeoffs within appropriations to fit forecast work within congressional billets, and ensuring accuracy of labor costing budget to Congress. The OCFO also tracks actuals and changes at the Agency level that will impact Centers, ensuring that budget dollars align with program requirements.

Office	Mission
Office of the Chief Financial Officer (OCFO)	This Mission Support Office provides professional leadership for the planning, analysis, justification, control, and reporting of all Agency fiscal resources.
OCFO Responsibilities Specific to Workforce Planning	
<ul style="list-style-type: none">▶ Oversee all financial management activities relating to the programs and operations of the Agency, including workforce concerns.▶ Develop and maintain an integrated Agency planning, programming, budgeting, performance, reporting, accounting, and financial management system, including financial reporting and financial management internal controls.▶ Lead the budgeting and execution phases of the planning, programming, budgeting, and execution process, including reviewing and validating Agency financial resource requirements and requests.▶ Monitor financial execution of the Agency budget in relation to actual expenditures, monitor quality and performance of ongoing financial activities, and analyze ongoing financial activities to proactively identify potential performance problems.▶ Lead development of an integrated set of goals, objectives, and metrics for the assigned Integrated Product Team (IPT) area (i.e., workforce, infrastructure, finance, management systems, or stakeholder commitment) and document this in annual white paper to be attached to the Mission Support Implementation Plan.▶ In concurrence with Center directors, determine the appropriate staffing complement for Center financial organizations.	

Program Analysis and Evaluation (PA&E)

Program Analysis and Evaluation (PA&E) has primary responsibility for the PPBE planning and programming phases. PA&E has the responsibility to independently assess program performance, make programmatic and institutional recommendations, perform cost analysis, and conduct strategic planning activities. PA&E ensures that all aspects of a major decision are considered and obtains pertinent information required to help the administrator make well-informed, timely decisions. PA&E has no budget authority or line responsibility for any Agency programs. Instead, PA&E provides data into the process helping with evaluating health and risks.

Office	Mission
Program Analysis and Evaluation	The PA&E is a staff office that serves as an independent assessment organization that provides objective, transparent, and multidisciplinary analysis of programs to inform strategic decision-making.

Office	Mission
(PA&E)	
PA&E Responsibilities Specific to Workforce Planning	
<ul style="list-style-type: none"> ▶ Integrate NASA's mission, strategic plan, budget, and performance plan to ensure alignment with the new exploration projects, NASA's strategic goals, Agency programs, and institutional requirements. ▶ Develop alternatives to resource planning and programming recommended by the Mission Directorates and the Office of Institutions and Management (OI&M), as required, and capture and publish all program and policy decisions rendered by the Agency's leadership during program and budget deliberations. ▶ Continually assess NASA's readiness to fulfill its strategic commitments through multiple indicators and mechanisms, including workforce plans and forecasts. 	

PA&E serves in an advisory capacity in the NASA Workforce Planning Governance Group, and has significant involvement in the Workforce Planning Technical Team and other technical teams, such as the AFNW Technical Team.

Some of the studies that PA&E leads are directly related to workforce planning. For example, the Systems Engineering and Institutional Transitions Team (SEITT) carried out the following activities in 2005-2006:

- ▶ PA&E led the SEITT, which studied NASA's long-term direction, with a specific focus on human capital and workforce, organization and management, support requirements and contracts, and infrastructure. In the workforce area, the SEITT study addressed the longer-term skills that NASA will need for space exploration and other parts of NASA's mission. The study discerned trends in demands for skills based on the assumption that the evolution of programs in areas such as exploration and aeronautics might dramatically alter the types of skills NASA needs, as well as the number and distribution of individuals with those skills. SEITT developed a spreadsheet that listed 110 "workforce competencies" currently in the NASA workforce and defined in the Agency's Competency Management System (CMS). SEITT then worked through the Headquarters MDs to characterize the relevance of each competency and selected a time designator (i.e., 2005–2011, 2012–2018, beyond 2018) for when the competency might be needed or trends that might indicate when it would be needed.

Starting in 2007, PA&E began developing the NASA Strategic Workforce Management Model (SWMM), an "FTE demand" model to be used in workforce planning activities. SWMM will be used to define NASA's work portfolio as a function of time and to capture the workers' competencies (type and number) that are needed to fulfill the government roles. SWMM will enable analysis of "what-if" scenarios on workforce size and skill sets, as well as project-workforce analyses.

Office of Program and Institutional Integration (OPII)

The Office of Program and Institutional Integration (OPII) provides input to PA&E concerning programming phase reports templates and reviews and provides comments on the draft *Strategic Planning Guidance* (SPG).



Office	Mission
Office of Program and Institutional Integration (OPII)	OPII is a staff office that provides an infrastructure for problem-solving and decision-making, particularly between Programs and Centers, facilitating programmatic process and providing oversight to ensure that systems are functioning effectively.
OPII Responsibilities Specific to Workforce Planning	
<ul style="list-style-type: none"> ▶ Manage integration of the workforce planning process, ensure workforce aligns with Center health requirements and Agency strategy, and serve as the point of contact to senior management. ▶ Ensure Centers are able to conduct full range of workforce planning analyses. ▶ Apply Agency resources (e.g., funding) or influence (e.g., distribution of work) to resolve serious anticipated misalignments that cannot be resolved by Centers or Programs alone. ▶ Set and communicate Agency workforce policies or guidance and adapt policies and guidance based on feedback (e.g., unintended negative consequences). 	

PA&E serves as a member of the NASA Workforce Planning Governance Group and has significant involvement in the Workforce Planning Technical Team and other technical teams, such as the AFNW Technical Team.

Mission Directorates (MD) and Programs

Mission Directorates (MD), given a variety of inputs, including inputs from Centers regarding their capabilities, must determine work and funding distributions to consider what roles/work will be outsourced, what work will remain in-house, what work will be assigned, and what work is competed (as far in advance as possible to allow Centers to plan). MDs must function in a complementary fashion at the most senior levels of NASA management because the multiple programs and mission of the organization require leadership bodies to provide centralized guidance and oversight. The oversight bodies listed below serve as the decision-making and performance oversight organizations necessary to ensure that program and project activities align with mission requirements and plans.

Office	Mission
Exploration Systems Mission Directorate (ESMD)	ESMD is responsible for creating a suite of new capabilities, called Constellation Systems, to enable human exploration. Constellation Systems include a crew exploration vehicle, transportation systems, lunar and planetary body exploration systems, in-space support systems, and ground-based support systems.
Space Operations Mission Directorate (SOMD)	SOMD is responsible for NASA space operations related to exploration in and beyond low-Earth orbit, with emphasis on human activities in space, as well as for management of NASA space operations related to launch services, space transportation, space communications and navigation, and rocket propulsion testing in support of human and robotic exploration requirements.
Science Mission Directorate (SMD)	SMD carries out the scientific exploration of Earth and space to expand the frontiers of Earth science, heliophysics, planetary science, and astrophysics, and manages a variety of robotic observatory and explorer craft through sponsored research.
Aeronautics Research	ARMD conducts research and technology activities to develop the knowledge, tools, and technologies to support development of future air and space vehicles



Office	Mission
Directorate (ARMD)	and to support the transformation of the U.S. air transportation system.
MD Responsibilities Specific to Workforce Planning	
<p>Each Mission Directorate, to some extent, has responsibility for the following:</p> <ul style="list-style-type: none">▶ Manage the integration of the workforce planning process, ensure workforce is aligned with Center health requirements and Agency strategy, and serve as the point of contact to senior management.▶ Ensure Centers are able to conduct full range of workforce planning analyses to support their corresponding programs.▶ Apply Agency resources (e.g., funding) or influence (e.g., distribution of work) to resolve serious anticipated misalignments that cannot be resolved by Centers or Programs alone.▶ Set and communicate workforce policies or guidance that must come from the Agency (requires that level of authority or must be applied consistently across the Agency) and adapt policies and guidance based on feedback (e.g., unintended negative consequences).▶ Develop a MD implementation plan designed to execute the strategic goals/objectives outlined in the NASA Strategic Plan, including focusing on needed workforce capabilities.▶ Oversee formulation and definition of programmatic requirements, objectives, and performance goals.	



Appendix F—FTE Tracking and Phasing: a Spreadsheet Example

Tracking and phasing full-time permanent (FTP) employees can begin with a simple spreadsheet. Figure F-1 is an example of such a spreadsheet and depicts how a phasing plan for bringing employees into an organization is set up, how full-time equivalents (FTE) are tracked on an ongoing basis, and how updating actuals drives the need to adjust the phasing plan.¹⁸ The spreadsheet defines each of the columns and associated fields.

Figure F-1: Example FTE Tracking and Phasing Spreadsheet

as of 10/26/2006														
DIRECTORATE <NAME>														
Proposed FTP Phasing Plan for FY07														
FTP														
	PP/ (Beg. Date)	BOP	GAIN*	LOSS**	RTD	LWOP	R/I	R/O	EOP	CUM HRS	FTP PP HRS	FTP YTD HRS	FTP FTE	FTP GAINS
OCT	1 (10/01/06)	60	0	0	0	0	0	0	60	80	4744.5	4744.5	59.31	
OCT	2 (10/15/06)	60	0	0	0	0	0	0	60	160	4750.0	9494.5	59.34	
NOV	3 (10/29/06)	60	0	1	0	0	0	0	59	240	4750.0	14244.5	59.35	Jenkins (loss)
NOV	4 (11/12/06)	59	0	0	0	0	0	0	59	320	4670.0	18914.5	59.11	
DEC	5 (11/26/06)	59	0	0	0	0	0	0	59	400	4670.0	23584.5	58.96	
DEC	6 (12/10/06)	59	0	0	0	0	1	0	60	480	4750.0	28334.5	59.03	#2 Human Resource Spec. (R/I proj. from GFD)
JAN	7 (12/24/06)	60	0	0	0	0	0	0	60	560	4750.0	33084.5	59.08	
JAN	8 (01/07/07)	60	0	1	0	0	0	0	59	640	4750.0	37834.5	59.12	
FEB	9 (01/21/07)	59	0	0	0	0	0	0	59	720	4670.0	42504.5	59.03	
FEB	10 (02/04/07)	59	0	0	0	0	0	0	59	800	4670.0	47174.5	58.97	
MAR	11 (02/18/07)	59	0	0	0	0	0	0	59	880	4670.0	51844.5	58.91	
MAR	12 (03/04/07)	59	0	0	0	0	0	0	59	960	4670.0	56514.5	58.87	
MAR	13 (03/18/07)	59	0	0	0	0	0	0	59	1040	4670.0	61184.5	58.83	
APR	14 (04/01/07)	59	0	0	0	0	0	0	59	1120	4670.0	65854.5	58.80	
APR	15 (04/15/07)	59	0	0	0	0	0	0	59	1200	4670.0	70524.5	58.77	
MAY	16 (04/29/07)	59	0	0	0	0	0	0	59	1280	4670.0	75194.5	58.75	
MAY	17 (05/13/07)	59	0	0	0	0	0	0	59	1360	4670.0	79864.5	58.72	
JUN	18 (05/27/07)	59	2	1	0	0	0	0	60	1440	4830.0	84694.5	58.82	2 COOP Conversions
JUN	19 (06/10/07)	60	0	0	0	0	0	0	60	1520	4750.0	89444.5	58.85	
JUL	20 (06/24/07)	60	0	0	0	0	0	0	60	1600	4750.0	94194.5	58.87	
JUL	21 (07/08/07)	60	0	1	0	0	0	0	59	1680	4750.0	98944.5	58.90	
AUG	22 (07/22/07)	59	0	0	0	0	0	0	59	1760	4670.0	103614.5	58.87	
AUG	23 (08/05/07)	59	0	0	0	0	0	0	59	1840	4670.0	108284.5	58.85	
SEP	24 (08/19/07)	59	0	0	0	0	0	0	59	1920	4670.0	112954.5	58.83	
SEP	25 (09/02/07)	59	0	0	0	0	0	0	59	2000	4670.0	117624.5	58.81	
SEP	26 (09/16/07)	59	0	1	0	0	0	0	58	2080	4670.0	122294.5	58.80	
			2	5	0	0	1	0			122294.5	122294.5		
GAINS*		2									FY07 FTP Ceiling		60	
LOSSES**		5									FY07 Total Ceiling		69	
R/I		1												
R/O		0												
*Includes RTD														
**Includes LWOP														
FTP PP HRS calculation estimates 50 hours incidental LWOP per PP.														

The spreadsheet tracks FTP employment for a sample Center MD. A given MD stays within an FTE ceiling by phasing the rate at which employees are hired in an effort to balance against the attrition rate.

¹⁸ This basic methodology for tracking and phasing FTP employees is a simplified portrayal designed to illustrate basic concepts. Following this general process explanation are more applied examples of Operational Workforce Planning considerations.



Each row of the spreadsheet represents a pay period. At the beginning of any pay period, the organization has an existing complement of FTP employees.¹⁹ Each pay period, personnel actions are effected in the Federal Personnel Payroll System (FPPS). Some personnel actions signify losses of FTP employees to the organization, which are subtracted from the current complement. These subtractions result from the following:

- ▶ **Loss**—Includes resignation, retirement, death, change between full time and part time, reassignment to another Center, and so on.
- ▶ **Reassignment Out**—Inter-Directorate reassignment or movement of an employee from one Directorate to another Directorate within the same Center.
- ▶ **Leave Without Pay (LWOP)**—When an employee is in a non-pay status exceeding 30 days, that employee does not contribute to the Center's FTE burn rate.

Some FPPS personnel actions signify additions of FTP employees to the organization. These additions result from the following:

- ▶ **Gain**—Includes appointment, transfer-appointment in, change between full time and part time, reassignment from another NASA Center, and so on.
- ▶ **Reassignment In**—Movement of an employee into a Directorate from another Directorate within the Center.²⁰
- ▶ **Return to Duty**—When an employee resumes work after being in a non-pay status, that employee will contribute to the Center's FTE burn rate.

The ultimate result of all of the additions and subtractions (which are made each pay period) is an end of the pay period complement of FTP organization employees.

Personnel actions that are counted in different categories, depending on context, include the following:

- ▶ **Conversion**—Occurs when Centers track/phase FTPs and other than full-time permanent (OTFTP) employees separately in such a way that a loss to one category and a gain to another will result from such FPPS actions as the conversion of students to permanent positions or the schedule change of an employee from part time to full time. Examples include conversions of term to FTP or conversions of student to term or FTP.
- ▶ **Incidental LWOP**—Although a personnel action is recorded when an employee takes long-term LWOP (> 30 days), neither short- nor long-term LWOPs are counted as losses, which allows for greater FTE flexibility.

When counting a particular FPPS action in one column or another, planners consider whether or not the action results in an addition or a subtraction to the total complement of the organization or category being considered, regardless of the particular nature of the action.

¹⁹ OTFTP are also included in the FTE ceiling.

²⁰ The promotion of an employee generally has no effect on an organization's ceiling. If, however, the promotion is the result of a vacancy announcement selection in which an employee will move to a position in a new organization (outside of the MD), then this is a loss for the old MD and a gain for the new MD.



The next step is to convert the unit of measure from individual FTP employees to hours worked. In one pay period, an FTP employee works 80 hours, so the number of FTP employees is multiplied by 80 hours to calculate the total number of hours worked during the pay period by the organization.²¹

The FTE burn rate is important for ceiling management because the burn rate can be compared with the ceiling in any pay period to determine whether or not the organization is on track to stay within (but be as close as possible to) its ceiling, assuming that the plan represented on the spreadsheet is carried out.

The final calculation of FTE burn rate on the line, representing the final pay period, shows where the organization will be in relation to its ceiling at the end of the year (when the numbers are converted to actuals), otherwise known as the cumulative burn rate for the year. A Center's FTE usage for the final pay period of the fiscal year will indicate the FTE levels the Center may expect at the beginning of the next year and how that onboard number will affect its hiring picture for the next fiscal year.

This simple spreadsheet embodies an important concept in Operational Workforce Planning, which is that making hires or sustaining losses early in the fiscal year has a greater impact on annual FTE burn rate than they do if they happen later in the year. For example, if we adjusted the example spreadsheet by adding 10 losses in the first pay period and adding 10 gains in the next pay period, there is no significant change to the annual FTE burn rate. If the gains are added into the last pay period (instead of the second), however, the plan then falls 9.24 FTE short of the original target. Therefore, it is generally advisable to plan gains as closely to losses as possible.

A second important concept that can be understood in terms of the spreadsheet is the difference between managing to a FTE ceiling target and managing to an onboard employee target (i.e., headcount). The spreadsheet illustrates the thinking behind how operational workforce planners managing to a FTE ceiling target maximize the use of paid work hours for an organization. The impact of this approach is that the organization's onboard number of employees may at times exceed the organization's FTE ceiling. This is normal and to be expected if it is part of a planned process. An example of this occurs during the summer, when some Centers have large numbers of students working.

An alternative approach to managing to an FTE ceiling is planning to an assigned onboard employee target, which occurs when an organization is authorized to backfill up to a certain number of billets or number of employees at any particular time. Managing to an onboard employee ceiling is less precise than using the previously described method because it is generally difficult for organizations to estimate the time required for an organization to backfill a loss. This can lead to situations in which the organization is successfully managing to its onboard ceiling, but losing the use of authorized FTE.

²¹ The total number of hours worked is tracked cumulatively to show year-to-date usage. Hours worked are also tracked as an FTE burn rate, which is the annualized pace of usage. An FTE burn rate is calculated by dividing the number of hours charged by 80 hours and by the number of the current pay period (1 to 26). This assumes a work year of 2,080 hours. For example, 1 FTE is 80 hours in pay period 1, 160 hours in pay period 2, 240 hours in pay period 3, and so on.



Normally, an organization tracks and phases two categories of employees in workforce planning: FTP and OTFTP employees. Key types of OTFTP employees are temp/term employees and part-time employees.²² In some cases, Centers may use additional categories to track and manage separately. For example, due to budget constraints, one Center began tracking and phasing positions whose salaries are charged to the Center Management and Operations (CM&O) work breakdown structure (WBS).

Phasing spreadsheets for OTFTP are similar to those for FTPs. The difference is that estimates of FTE that will be burned are based on history or estimation rather than on an assumption that each employee will burn 80 hours per pay period. Consider that a term employee typically burns 80 hours per pay period. Thus, the most significant difference between FTP and OTFTP employees is that FTPs are career-conditional. FTP and OTFTP FTP are similar in that they are updated each pay period with actuals in the same way, and that these updates drive any needed changes to the phasing of hiring.

²² Students, Co-Ops, and Student Career Experience Program (SCEP) participants are part of the Student category and are not considered OTFTP.



Appendix G—FAIR Act Inventory at NASA

History of FAIR Act at NASA

Since its inception, NASA has contracted with the private and academic sectors for most of the products and services it uses and develops. The majority of NASA's authorized funding each year supports contracts, grants, and other agreements sustaining a variety of scientific, technical, and support services managed by the Agency and its ten Centers. Less than 13 percent of NASA's authorized funding is expended on civil service salaries and benefits.²³ NASA estimates that total direct private sector employment resulting from these expenditures exceeds 100,000 work years of effort annually.

In 1998, Congress passed the Federal Activities Inventory Reform Act (FAIR Act) requiring all Federal Government agencies to maintain an annual record of commercial, non-inherently governmental activities performed by civil service personnel. In addition, the Office of Management and Budget (OMB) also required agencies to report inherently governmental activities in a concurrent inventory.²⁴ The FAIR Act inventories allow NASA managers to identify these activities and consider the costs of performing these in-house versus contracting for needed services. The FAIR Act requires that all cost estimates associated with these activities (e.g., quality assurance, technical monitoring, liability insurance, overhead costs) be included in the inventory and that they be realistic and fair.

These inventories, which are made available to the public each year, also allow interested outside groups to review these activities and challenge an omission of a particular activity from or an inclusion of a particular activity on the list. This publicly available list also ensures that NASA adheres to a competitive process when contracting with a private sector source for performance of these activities.

In the first years of the FAIR Act, the Agency Human Resources Office was responsible for issuing the inventory call to Centers, compiling all responses, preparing the inventory to submit to OMB, and managing challenges from third parties to the inventory. In 2002, when NASA's mission was refocused to meet the requirements of the President's Management Agenda (PMA), OMB made competitive sourcing an increasingly important priority. At that time, NASA administrators determined that the Office of Procurement, because it has more direct knowledge of contracted activities than the Human Resources Office, was the logical choice to lead the FAIR Act inventory, with the Human Resources Office playing a supporting role; however, in some Centers the Human Capital Office still leads this annual process.

The first year that NASA completed a FAIR Act inventory, the Agency received about six challenges, primarily from a consortium of private industry interest groups. This consortium was concerned not with the inventory itself, but with those activities they believed were missing from the inventory because the inventory had no commercial FTEs in those areas.

²³ *Competitive Sourcing Overview*, NASA FAIR Act Inventory, 2004.

²⁴ OMB defined "inherently governmental activities" as those that are so intimately related to the public interest as to require performance by only Federal Government employees. Although this definition has not changed since the 2006 FAIR Act inventory, Centers should reference <http://competitivesourcing.nasa.gov/> for related updates before the inventory exercise.

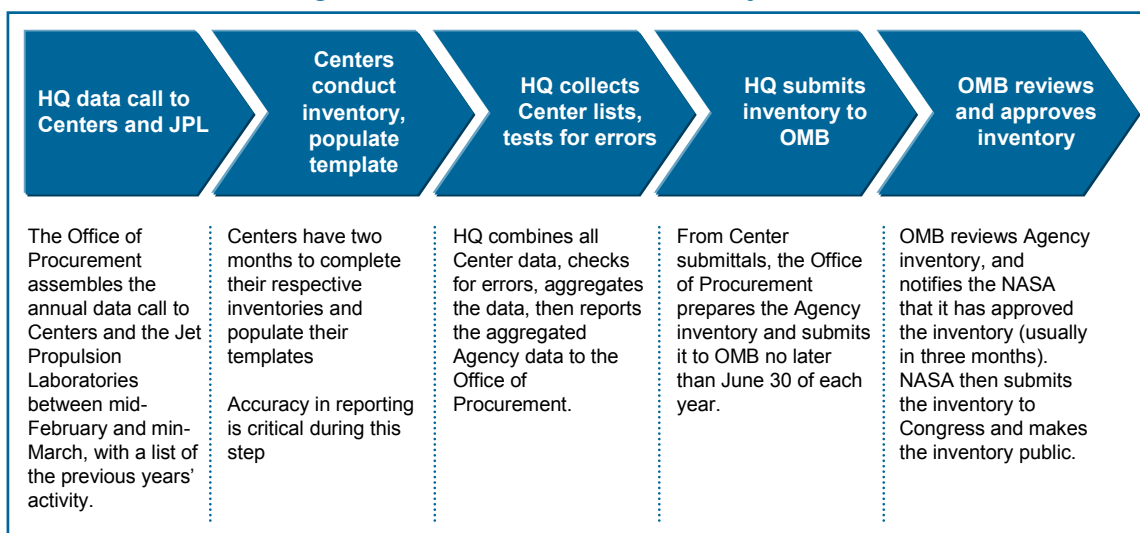
NASA did not modify its inventory as a result of these challenges because the Agency believed that all contracted activities were properly represented. NASA went so far as to collect additional information from onsite and near-site support service contractors to verify all commercial functions conducted across the organization and to better respond to future third-party challenges. These contractor data are not forwarded to OMB.

In the second year of the inventory, NASA received fewer challenges and, subsequently, no groups have challenged NASA inventories or practices.

Preparing the FAIR Act Inventory

No later than June 30, the end of the third quarter of each fiscal year, NASA submits to the director of OMB a list of non-inherently governmental activities performed by Federal Government sources that includes the first fiscal year that the activity appears and the number of FTEs needed to perform the activity. Preparing this complete and accurate list involves close coordination with each Center as well as with Agency managers. Figure G-1 summarizes the activities associated with the preparation and submittal of this inventory.

Figure G-1: NASA FAIR Act Inventory Process



Centers, Headquarters, the Office of the Inspector General, the Jet Propulsion Laboratory (JPL), and the NASA Shared Services Center (NSSC) each must submit an electronic copy of their respective completed inventory template to a designated official within the Office of Human Capital Management (OHCM) on or before May of the current fiscal year, with copies to the Agency Competitive Sourcing Team (ACST). The ACST will hold one initial teleconference to answer Center questions relative to the inventory process prior to the submittal date. Centers shall not modify the spreadsheet templates provided by HQ because they will be used to collate and transform all data into the required OMB format after all data are collected and integrated.²⁵

²⁵ Centers should verify that definitions and guidance for characterizing inherently governmental activities and commercial activities have not changed from the previous year. General and specific coding guidance relative to inherently governmental or commercial activities is available on the OMB website at



These inventories (assembled and submitted as a single worksheet) must ensure that the civil service FTE total matches the numbers provided in the President's budget, which usually means that Centers must report their FTE allocation over a year's time. As in years past, OMB requires written justification for all functions that are characterized as Commercially Available—Reason Code "A" or for functions whose characterization has changed since the previous year's inventory.

Further, because HQ requests FTE data at an organizational level, Centers must comply by generating inventories that reveal FTE allocations subdivided by organization appropriately within the 2-month period provided by HQ. FTE data at the organizational level helps both the Agency and the Centers identify and plan for costs and FTE requirements against project and program requirements throughout the year.²⁶ The Centers provide data to HQ at the organizational level, but the data report that HQ submits to OMB is subdivided only to the Center level, not the organizational level.

As presented in Figure G-2, NASA had a planned civil service level in 2007 of 18,313 FTEs. Within the civil service workforce, 5,476 FTEs are in commercial activities and 12,837 FTEs are inherently governmental. The commercial activities FTEs are further divided between those that the Agency needs to keep in-house (Commercial Reason Code A), those subject to the requirements of OMB Circular A-76 (Commercial Reason Code B), those activities that are the subject of in-progress standard competitions and NASA's science competitions (Reason Code C), and those that are performed by government personnel as a result of NASA's science competitions (Reason Code D).

<http://www.whitehouse.gov/omb/procurement/fair-index.html> or the NASA Competitive Sourcing website at <http://competitivesourcing.nasa.gov/>. Additional instructions may be required if OMB issues new guidance or as NASA develops its competitive sourcing plan that is acceptable to OMB. The ACST will issue additional guidance to the Center points of contact as soon as new requirements are known.

²⁶ Center managers and planners typically work closely with their contract offices or with their OCFO to determine contractor work-year equivalents (WYE) for their various projects.

Figure G-2: Commercial Activities Inventory, Executive Summary Data Table, June 2007²⁷

Functions	Civil Service		
	Inherently Governmental	Commercial	All Civil Servants
A - Recurring Testing and Inspection Services	177	26	203
B - Personnel Management	344	125	469
C - Finance and Accounting	1,354	220	1,574
D - Regulatory and Program Management Support Services	464	108	572
E - Environment	114	9	123
F - Procurement	879	59	938
G - Social Services	10	1	11
H - Health Services	45	11	56
I - Investigations	162	67	229
K - Depot Repair, Maintenance, Modification, Conversion or Overhaul of Equipment	8	9	17
L - Grants Management	7	2	9
M - Forces and Direct Support	2	0	2
P - Base Maintenance/Multifunction Contracts	41	4	45
R - Research, Development, Test, and Evaluation (RDT&E)	7,656	4,154	11,810
S - Installation Services	289	180	469
T - Other Nonmanufacturing Operations	297	159	456
U - Education and Training	71	57	128
W - Communications, Computing, and Other Information Services	364	112	476
Y - Force Management And General Support	552	169	721
Z - Maintenance, Repair, Alteration, and Minor Construction of Real Property	1	4	5
Total - All Functions	12,837	5,476	18,313

Because Centers expect only marginal changes in FTE structure and count from year to year, the current year's inventory should not deviate dramatically from the prior year's, with the exception of those instances in which a Center reorganization occurs.

²⁷ Table from <http://competitivesourcing.nasa.gov/2007fairindex.html>; does not include JPL.



Appendix H—Data Elements Contained in WICN

Cube	Purpose	Key Dimensions	Key Measures
Workforce Profile	Characterization of workforce and status trend	Perm/non-perm., status trend for last 4 quarters, diversity, occupations, retirement eligibility information	Headcount, average age, average years of service
Workforce Profile Detail	Workforce profile for detailed reporting, analysis of current strength, and analysis of trends	All demographics All function, competency, position cuts Orgs down to Org-2 level	Average GS grade, average performance rating, salary and benefits
Workforce Diversity	Workforce profile for detailed EEO reporting and analysis	All disabilities All PATCOB	Avg. GS grade, average performance rating, salary and benefits
Workforce History	Same data as Workforce Profile, with history since October 1992	All years	Headcount, average age, average years of service, with history since October 1992
Workforce History Detail	Same data as Workforce Profile Detail, with history since October 1992	All years	Average GS grade, average performance rating, salary and benefits, with history since October 1992
Workforce Climate	Same data as Workforce Profile Detail, but with added measures and pay period trends	All recent pay periods	Comp time, overtime, sick leave, months in grade, average grade
Gains & Losses	Shows gains and losses without inter-Center transfers	All losses and all outside hires (does not include conversions)	
Gains & Losses Detail	Shows gains and losses, including inter-Center transfers	All conversions, separations and reason, FERS versus CSRS losses	Attrition rate, average grade of hires
Buyouts	Buyout reporting		VSIP payment
WIMS Planning	Planned distribution of workforce as entered into Agency WIMS WPS	Center, Mission Directorate, competency, planning year	FTE



Cube	Purpose	Key Dimensions	Key Measures
Available for New Work	Profile of FTE not planned against current or future projects	Center, Mission Directorate, competency, planning year	FTE
Loss Forecast	Project retirements and other losses	Retirements and other attrition	Annual retirements, other losses, linger time, attrition rate
Workforce Analysis	Combination of status history and dynamics data to yield information useful for workforce analysts in understanding changes in the workforce		
Supply Trend	Shows how workforce will look over the next five years after projected attrition and aging		Headcount, average age, average grade
Workforce Deployment	Shows recent trend in how workforce is allocated across organizations and projects	Time, organization, program, position, competency, demographics	Headcount, FTE, average age, average years of service, average/ aggregate salary and benefits
Promotions & Awards	Shows award received by staff and amounts	Promotions, awards, QSI	Award amount
Promotions & Awards Detail	Shows staff details in addition to awards received	Diversity	Months in grade at time of promotion, promotion rate, average performance rating
Workforce Supply, Workforce Demand, Workforce Supply versus Demand	Cubes to implement workforce model being developed with PA&E	Project, competency, Center, year	FTE
FTE	FTE trend	Time	FTE ceiling, FTE, equivalent heads
Ceiling Control History	Permanent record of the FTE or other ceiling allocations to Centers over time	Date, Center, source	FTE, FTP FTE



Appendix I—Acronym List

ACST	Agency Competitive Sourcing Team
AFNW	Available for New Work
ALDS	Agency Labor Distribution System
ARMD	Aeronautics Research Mission Directorate
ASAP	Aerospace Safety Advisory Panel
AWARE	Automated Workforce Actuals Reporting System
BW	Business Warehouse
BY	Budget Year
CAPS	Complement Allocation Planning System
CFR	Code of Federal Regulations
CM&O	Center Management and Operations
CMS	Competency Management System
CSRS	Civil Service Retirement System
CY	Calendar Year
DDT&E	Design, Development, Test and Evaluation
DFRC	Dryden Flight Research Center
DOI	U.S. Department of the Interior
EEO	Equal Employment Opportunity
ESMD	Exploration Systems Mission Directorate
FAIR	Federal Activities Inventory Reform
FCIP	Federal Career Intern Program
FERS	Federal Employee Retirement System
FMR	Financial Management Regulation
FPPS	Federal Personnel Payroll System
FTE	Full-Time Equivalent
FTP	Full-Time Permanent
FY	Fiscal Year
G&A	General and Administrative
GAO	U.S. Government Accountability Office
GS	General Schedule
HCAAF	Human Capital Assessment and Accountability Framework
HCIE	Human Capital Information Environment
HQ	Headquarters
IG	Inspector General
IIA	Institutional Infrastructure Analysis



IPA	Intergovernmental Personnel Act
KIC	Knowledge Information Center
JPL	Jet Propulsion Laboratory
LaRC	Langley Research Center
LBA	Labor Budget Analyst
LPM	Labor Pricing Module
LWOP	Leave Without Pay
MD	Mission Directorate
MSO	Mission Support Office
NAC	NASA Advisory Committee
NAPA	National Academy of Public Administration
NASA	National Aeronautics and Space Administration
NF	NASA Form
NODIS	NASA Online Directives Information System
NOPS	NASA Organizational Profile System
NPD	NASA Policy Directive
NPR	NASA Procedural Requirement
NSSC	NASA Shared Services Center
OCHCO	Office of the Chief Human Capital Officer
OCFO	Office of the Chief Financial Officer
OHCM	Office of Human Capital Management
OI&M	Office of Institutions and Management
OMB	U.S. Office of Management and Budget
OMC	Operations Management Council
OPII	Office of Program and Institutional Integration
OPM	U.S. Office of Personnel Management
OTFTE	Other Than Full-Time Equivalent
PAA	Program Analysis and Alignment
PA&E	Program Analysis and Evaluation
PAIG	Programmatic and Institutional Guidance
PATCOB	Professional, Administrative, Technical, Clerical, Other, and Blue-Collar
PDM	Program Decision Memorandum
PDW	Personal Data Warehouse
PMA	President's Management Agenda
PMC	Program Management Council
PMF	Presidential Management Fellows
PPBE	Planning, Programming, Budgeting, and Execution
PRG	Program and Resources Guidance
PRLS	Program/Project Requirements Library System



PTP	Part-Time Permanent
QSI	Quality Step Increase
RDT&E	Research, Development, Test, and Evaluation
RIF	Reduction in Force
RTF	Return to Flight
SATERN	System for Administration, Training and Educational Resources
SCEP	Student Career Experience Program
S&E	Science and Engineering
SEITT	Systems Engineering and Institutional Transitions Team
SMC	Strategic Management Council
SMD	Science Mission Directorate
SOMD	Space Operations Mission Directorate
SPG	Strategic Planning Guidance
SSC	Stennis Space Center
SWFP	Strategic Workforce Planning
SWMM	Strategic Workforce Management Model
VERA	Voluntary Early Retirement Authority
VSIP	Voluntary Separation Incentive Program
WBS	Work Breakdown Structure
WICN	Workforce Information Cubes for NASA
WIMS	Workforce Integrated Management System
WISP	Workforce Integrated Strategic Plan
WPS	Workforce Planning System
WYE	Work Year Equivalent

